
**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, DC 20549

FORM 8-K

CURRENT REPORT

**Pursuant to Section 13 or 15(d) of the
Securities Exchange Act of 1934**

Date of Report (Date of earliest event reported): May 12, 2016

OpGen, Inc.

(Exact name of registrant as specified in its charter)

**Delaware
(State or other jurisdiction of
incorporation or organization)**

**001-37367
(Commission
File Number)**

**06-1614015
(I.R.S. Employer
Identification No.)**

**708 Quince Orchard Road, Suite 205
Gaithersburg, MD 20878
(Address of principal executive offices, including zip code)**

**(240) 813-1260
(Registrant's telephone number, including area code)**

**Not Applicable
(Former name or former address, if changed since last report)**

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (see General Instruction A.2. below):

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
 - Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
 - Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
 - Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))
-

Item 1.01 Entry into a Material Definitive Agreement.

Securities Purchase Agreement

On May 12, 2016, OpGen, Inc., a Delaware corporation (the "Company"), entered into a securities purchase agreement (the "Securities Purchase Agreement") with certain investors named therein, including certain officers, directors and affiliates of the Company (the "Investors"), pursuant to which the Company agreed to issue and sell an aggregate of 9,053,556 units ("Units") to Investors, at a purchase price of \$1.14375 per unit, for an aggregate purchase price of approximately \$10.355 million in a private placement (the "Offering"). Each unit consists of one share of the Company's common stock, par value \$0.01 per share (the "Common Stock") and warrants to acquire 0.75 of one share of Common Stock (the "Warrants"). The Units will separate into Common Stock and Warrants at closing and the Company will issue an aggregate of 9,053,556 shares of Common Stock (the "Shares") and Warrants exercisable for an aggregate of 6,790,169 shares of Common Stock (the "Warrant Shares") to the Investors in the Offering.

The Offering was made solely to accredited investors (as defined in Rule 501(a) under the Securities Act of 1933, as amended (the "Securities Act")) in reliance upon the exemption from registration in Section 4(a)(2) of the Securities Act and Rule 506 of Regulation D. The Offering is expected to close in two tranches, with the first tranche expected to close on or about May 19, 2016. Closing of the second tranche of the Offering is subject to receipt of stockholder approval because the issuance of Common Stock in the second closing will constitute a "change of control" under the Nasdaq Stock Market Listing Rules. The Company will pay approximately \$625,000 in placement agent fees in connection with the Offering.

Pursuant to the Securities Purchase Agreement, the Company has agreed to provide certain mandatory registration rights and piggyback registration rights to the Investors in respect of the Shares and the Warrant Shares customary for this type of private placement. Specifically, the Company has agreed to file a registration statement on Form S-3 (or other registration statement, if the Company is not then eligible to use Form S-3) (the "Registration Statement") within 60 days of execution of the Securities Purchase Agreement. The Company has agreed to keep the Registration Statement effective until all Shares have been sold by Investors or may be sold without restriction under Rule 144, promulgated under the Securities Act of 1933, as amended. In addition, to the extent that the Registration Statement is not available, the Investors will have piggyback registration rights with respect to a registration statement that the Company proposes to file (subject to certain exceptions). The Company will pay all fees and expenses incident to the registration rights provided to Investors.

Upon the occurrence of certain events, including the failure of the Company to file a registration statement or have it declared effective by the Securities and Exchange Commission in accordance with the terms of the Securities Purchase Agreement as described above, the Company will be obligated to pay to the Investors, as liquidated damages, 1.0% of the aggregate purchase price of the Shares and Warrant Shares then held by Investors on a monthly, pro-rated basis, until the event triggering such payment is cured. Interest on these liquidated damages will accrue at the rate of 1.0% per month, pro-rated for partial months, until paid in full.

In addition the Securities Purchase Agreement provides that, for a period of two years, Investors also have the right to participate on a pro rata basis in subsequent offerings of the Company (subject to certain exceptions). The Securities Purchase Agreement also provides that, for a period of 90 days from the date of the Securities Purchase Agreement, the Company is prohibited from issuing any Common Stock or securities convertible into common stock (subject to certain exceptions). In addition, the Company's officers, directors and holders in excess of 5% of the Company's outstanding Common Stock have agreed to enter into a lock-up agreement in connection with the Offering, which generally prohibits them from selling securities of the Company for a period of 90 days from the date of the Securities Purchase Agreement.

Common Stock Warrants

The Warrants will be exercisable at an exercise price of \$1.3125 per share of Common Stock, will become exercisable 90 days after the date of issuance, and may be exercised for five years. The exercise price and the number of Warrant Shares will be adjusted to account for the subdivision or combination by the Company of outstanding shares of Common Stock. The exercise price may at anytime also be voluntarily reduced at the discretion of the Board of Directors of the Company. The Warrants may be exercised pursuant to a cashless exercise, but only if a registration statement covering the resale of the Warrant Shares that are the subject of an exercise notice is not available for the resale of such Warrant Shares.

The Securities Purchase Agreement and the Warrants also contain certain provisions providing for liquidated damages to be paid by the Company in the event the Company does not timely deliver registered shares of Common Stock to the holder upon exercise the Warrant. Specifically, in addition to the Warrant holder's other available remedies, if the Company fails to issue and deliver (or cause to be delivered) to a holder by the required delivery date a certificate representing the shares so delivered to the Company by such holder that is free from all restrictive and other legends, the Company shall pay to a holder in cash, as partial liquidated damages and not as a penalty, an amount equal to 1% of the product of (A) the aggregate number of shares of Common Stock not issued to the holder on a timely basis and to which the holder is entitled and (B) the closing sale price on the trading day immediately preceding the required delivery date of the certificate, per trading day for each trading day after such required delivery date until such Securities are delivered to the holder. In addition, if the Company fails to (i) issue and deliver (or cause to be delivered) to a holder by the required delivery date a certificate representing the shares so delivered to the Company by such holder that is free from all restrictive and other legends or (ii) if after the required delivery date such holder purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by such holder of all or any portion of the number of shares of Common Stock, or a sale of a number of shares of Common Stock equal to all or any portion of the number of shares of Common Stock that such holder anticipated receiving from the Company without any restrictive legend, then, the Company shall either (i) pay cash to the holder in an amount equal to the holder's total purchase price (including brokerage commissions and other out-of-pocket expenses, if any) for the shares of Common Stock so purchased (the "Buy-In Price"), over the product of (A) such number of shares of Common Stock that the Company was required to deliver to such holder by the Legend Removal Date multiplied by (B) the lowest closing sale price of the Common Stock on any Trading Day during the period commencing on the date of the delivery by such holder to the Company of the applicable Shares (as the case may be) and ending on the date of such delivery and payment under this clause (ii).

A copy of the Form of Warrant and the Securities Purchase Agreement are filed as Exhibits 4.1 and 10.1, respectively, to this Current Report on Form 8-K and are incorporated by reference herein. The foregoing description of the terms of the Form of Warrant and the Securities Purchase Agreement is only a summary of the material terms of the Form of Warrant and the Securities Purchase Agreement and does not purport to be complete. Such description is qualified in its entirety by reference to such exhibits.

Item 3.02 Unregistered Sales of Equity Securities.

The information contained above in Item 1.01 is hereby incorporated by reference into this Item 3.02.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

<u>Exhibit</u>	<u>Description</u>
-----------------------	---------------------------

4.1	Form of Warrant to Purchase Common Stock
-----	--

10.1	Securities Purchase Agreement, dated as of May 12, 2016, by and among the Company and the purchasers party thereto
------	--

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

OpGen, Inc.

/s/ Timothy C. Dec

Name: Timothy C. Dec

Title: Chief Financial Officer

Date: May 17, 2016

EXHIBIT INDEX

Exhibit No. Document

4.1 Form of Warrant to Purchase Common Stock

10.1 Securities Purchase Agreement, dated as of May 12, 2016, by and among the Company and the purchasers party thereto*

* The schedules and exhibits to the Securities Purchase Agreement have been omitted from this filing pursuant to Item 601(b)(2) of Regulation S-K. The Company will furnish copies of any such schedules and exhibits to the U.S. Securities and Exchange Commission upon request.

NEITHER THIS SECURITY NOR THE SECURITIES FOR WHICH THIS SECURITY IS EXERCISABLE HAVE BEEN REGISTERED WITH THE SECURITIES AND EXCHANGE COMMISSION OR THE SECURITIES COMMISSION OF ANY STATE. THIS SECURITY HAS BEEN, AND THE SECURITIES FOR WHICH THIS SECURITY IS EXERCISED MAY BE, ISSUED IN RELIANCE UPON AN EXEMPTION OR EXEMPTIONS FROM REGISTRATION UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), AND, IN EACH SUCH CASE, MAY NOT BE OFFERED OR SOLD EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OR PURSUANT TO AN AVAILABLE EXEMPTION FROM, OR IN A TRANSACTION NOT SUBJECT TO, THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT AND IN ACCORDANCE WITH APPLICABLE STATE SECURITIES LAWS. THIS SECURITY AND THE SECURITIES ISSUABLE UPON EXERCISE OF THIS SECURITY MAY BE PLEDGED IN CONNECTION WITH A BONA FIDE MARGIN ACCOUNT OR OTHER LOAN SECURED BY SUCH SECURITIES.

OPGEN, INC.

Warrant To Purchase Common Stock

Warrant No.:

Number of Shares of Common Stock: _____

Date of Issuance: _____, ____, 2016 ("**Issuance Date**")

OpGen, Inc., a company organized under the laws of Delaware (the "**Company**"), hereby certifies that, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, _____, the registered holder hereof or its permitted assigns (the "**Holder**"), is entitled, subject to the terms set forth below, to purchase from the Company, at the Exercise Price (as defined below) then in effect, upon surrender of this Warrant to Purchase Common Stock (including any Warrants to Purchase Common Stock issued in exchange, transfer or replacement hereof, the "**Warrant**"), at any time or times on or after the Initial Exercisability Date (as defined below), but not after 11:59 p.m., New York time, on the Expiration Date (as defined below), _____ (each warrant to purchase 0.75 of a share of the Company's Common Stock) fully paid nonassessable shares of Common Stock, par value \$0.01 per share, subject to adjustment as provided herein (the "**Warrant Shares**"). Except as otherwise defined herein, capitalized terms in this Warrant shall have the meanings set forth in Section 20. This Warrant is one of the Warrants to purchase Common Stock (the "**SPA Warrants**") issued pursuant to that certain Securities Purchase Agreement, dated as of [_____] [__], 2016 (the "**Subscription Date**"), by and among the Company and the investors (the "**Buyers**") referred to therein the "**Securities Purchase Agreement**").

1. EXERCISE OF WARRANT.

(a) **Mechanics of Exercise.** Subject to the terms and conditions hereof (including, without limitation, the limitations set forth in Section 1(i)), this Warrant may be exercised by the Holder at any time or times on or after the Initial Exercisability Date and on or before the Expiration Date, in whole or in part, by (i) delivery (whether via facsimile, electronic mail or otherwise) of a written notice, in the form attached hereto as **Exhibit A** (the "**Exercise Notice**"), of the Holder's election to exercise this Warrant and (ii) (A) payment to the Company of an amount equal to the applicable Exercise Price multiplied by the number of Warrant Shares as to which this Warrant is being exercised (the "**Aggregate Exercise Price**") in cash or by wire transfer of immediately available funds or (B) by notifying the Company that this Warrant is being exercised pursuant to a Cashless Exercise (as defined in Section 1(f)). The Holder shall not be required to deliver the original Warrant in order to effect an exercise hereunder nor shall any ink-original signature or medallion guarantee (or other type of guarantee or notarization) with respect to any Exercise Notice be required. Execution and delivery of the Exercise Notice with respect to less than all of the Warrant Shares shall have the same effect as cancellation of the original Warrant and issuance of a new Warrant evidencing the right to purchase the remaining number of Warrant Shares. On or before the first (1st) Trading Day following the date on which the Company has received the applicable Exercise Notice, the Company shall transmit by facsimile or electronic mail an acknowledgment of confirmation of receipt of the Exercise Notice, in the form attached to the Exercise Notice, to the Holder and the Company's transfer agent (the "**Transfer Agent**"). So long as the Holder delivers the Aggregate Exercise Price (or notice of a Cashless Exercise) on or prior to the second (2nd) Trading Day following the date on which the Exercise Notice has been delivered to the Company, then on or prior to the third (3rd) Trading Day following the date on which the Exercise Notice has been delivered to the Company, or, if the Holder does not deliver the Aggregate Exercise Price (or notice of a Cashless Exercise) on or prior to the second (2nd) Trading Day following the date on which the Exercise Notice has been delivered to the Company, then on or prior to the second (2nd) Trading Day following the date on which the Aggregate Exercise Price (or notice of a Cashless Exercise) is delivered (the "**Share Delivery Date**"), the Company shall (X) provided that the Transfer Agent is participating in The Depository Trust Company ("**DTC**") Fast Automated Securities Transfer Program, upon the request of the Holder, credit such aggregate number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the Holder's or its designee's balance account with DTC through its Deposit/Withdrawal At Custodian system, or (Y) if (i) the Transfer Agent is not participating in the DTC Fast Automated Securities Transfer Program or (ii) the shares to be issued have not been registered under the Securities Act or are not freely transferable without restriction or limitation pursuant to Rule 144 under the Securities Act, issue and dispatch by overnight courier to the address as specified in the Exercise Notice, a certificate, registered in the Company's share register in the name of the Holder or its designee, for the number of shares of Common Stock to which the Holder is entitled pursuant to such exercise. The Company shall be responsible for all fees and expenses of the Transfer Agent and all fees and expenses with respect to the issuance of Warrant Shares via DTC, if any, including without limitation for same day processing. Upon delivery of the Exercise Notice, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date such Warrant Shares are credited to the Holder's DTC account or the date of delivery of the certificates evidencing such Warrant Shares, as the case may be; provided payment of the Aggregate Exercise Price (other than in the case of a Cashless Exercise) is received within three Trading Days of delivery of the Exercise Notice. If this Warrant is submitted in connection with any exercise pursuant to this Section 1(a) and the number of Warrant Shares represented by this Warrant submitted for exercise is greater than the number of Warrant Shares being acquired upon an exercise, then the Company shall as soon as practicable and in no event later than three (3) Trading Days after any exercise and at its own expense, issue a new Warrant (in accordance with Section 7(d)) representing the right to purchase the number of Warrant Shares issuable immediately prior to such exercise under this Warrant, less the number of Warrant Shares with respect to which this Warrant is exercised.

(b) No Fractional Shares. No fractional shares of Common Stock or scrip representing fractional shares are to be issued upon the exercise of this Warrant, but rather the number of shares of Common Stock to be issued shall be rounded up to the nearest whole number.

(c) Charges, Taxes and Expenses. Issuance of Warrant Shares shall be made without charge to the holder for any issue or transfer tax or other incidental expense in respect of the issuance of such Warrant Shares, all of which taxes and expenses shall be paid by the Company, and such Warrant Shares shall be issued in the name of the holder or in such name or names as may be directed by the holder; *provided, however*, that in the event that Warrant Shares are to be issued in a name other than the name of the holder, this Warrant when surrendered for exercise shall be accompanied by the Assignment Form attached hereto as Exhibit B duly executed by the holder and the Company may require, as a condition thereto, the payment of a sum sufficient to reimburse it for any transfer tax incidental thereto. The Company shall pay all Transfer Agent fees required for same-day processing of any Exercise Notice and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Warrant Shares.

(d) Exercise Price. For purposes of this Warrant, "**Exercise Price**" means \$1.3125 per share, which shall be a price that is at a 25% premium to the Closing Bid Price per share on the Subscription Date, subject to adjustment as provided herein.

(e) Company's Failure to Timely Deliver Securities. In addition to any other rights available to Holder, if, within three (3) Trading Days after the Company's receipt of the Exercise Notice and the Aggregate Exercise Price (or notice of Cashless Exercise), the Company shall fail to issue and deliver a certificate without restrictive legend to the Holder and register such shares of Common Stock on the Company's share register or credit the Holder's balance account with DTC for the number of shares of Common Stock to which the Holder is entitled upon the Holder's exercise hereunder or pursuant to the Company's obligation pursuant to clause (ii) below, and if on or after such Trading Day the Holder purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by the Holder of shares of Common Stock issuable upon such exercise that the Holder anticipated receiving from the Company (a "**Buy-In**"), then, in addition to all other remedies available to the Holder, the Company shall, within three (3) Trading Days after the Holder's request and in the Holder's discretion, either (i) pay cash to the Holder in an amount equal to the Holder's total purchase price (including brokerage commissions and other reasonable out-of-pocket expenses, if any) for the shares of Common Stock so purchased (the "**Buy-In Price**"), at which point the Company's obligation to deliver such certificate (and to issue such shares of Common Stock) or credit such Holder's balance account with DTC shall terminate, or (ii) promptly honor its obligation to deliver to the Holder a certificate or certificates representing such shares of Common Stock or credit such Holder's balance account with DTC and pay cash to the Holder in an amount equal to the excess (if any) of the Buy-In Price over the product of (A) such number of shares of Common Stock, times (B) any trading price of the Common Stock selected by the Holder in writing as in effect at any time during the period beginning on the applicable Exercise Date and ending on the applicable Share Delivery Date. In addition to the foregoing, if the Company fails for any reason to deliver to the Holder the Warrant Shares subject to an Exercise Notice by the Share Delivery Date, the Company shall pay to the Holder, in cash, as partial liquidated damages and not as a penalty, for each Trading Day that the Warrant Shares are not delivered until such delivery is made or the Holder rescinds the exercise, an amount equal to 1% of the product of (A) the aggregate number of shares of Common Stock not issued to the Holder on a timely basis and to which the Holder is entitled and (B) the Closing Sale Price on the Trading Day immediately preceding the Share Delivery Date, per Trading Day for each Trading Day after such Share Delivery Date until such shares of Common Stock are delivered to the Holder or the Holder rescinds such exercise at any time prior to the issuance of the Warrant Shares. The foregoing shall be without prejudice to any other rights and recourses of Holder in connection with the failure of the Company to deliver and register the shares as aforesaid.

(f) Cashless Exercise. Notwithstanding anything contained herein to the contrary, if a Registration Statement (as defined in the Securities Purchase Agreement) covering the resale of the Warrant Shares that are the subject of the Exercise Notice pursuant to the Securities Act (the "Unavailable Warrant Shares") is not available for the resale of such Unavailable Warrant Shares by sixty (60) days after the Subscription Date, the Holder may, in its sole discretion (and without limiting the Holder's rights and remedies contained herein or in any of the other Transaction Documents (as defined in the Securities Purchase Agreement)), exercise this Warrant in whole or in part and, in lieu of making the cash payment otherwise contemplated to be made to the Company upon such exercise in payment of the Aggregate Exercise Price, elect instead to receive upon such exercise the "Net Number" of shares of Common Stock determined according to the following formula (a "Cashless Exercise"):

$$\text{Net Number} = \frac{(A \times B) - (A \times C)}{B}$$

For purposes of the foregoing formula:

A= the total number of shares with respect to which this Warrant is then being exercised.

B = the last VWAP immediately preceding the time of delivery of the Notice of Exercise giving rise to the applicable "cashless exercise", as set forth in the applicable Exercise Notice (to clarify, the "last VWAP" will be the last VWAP as calculated over an entire Trading Day such that, in the event that this Warrant is exercised at a time that the Trading Market is open, the prior Trading Day's VWAP shall be used in this calculation).

C = the Exercise Price then in effect for the applicable Warrant Shares at the time of such exercise.

“**VWAP**” means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported in the “Pink Sheets” published by OTC Markets Group, Inc. (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Holder and reasonably acceptable to the Company, the fees and expenses of which shall be paid by the Company.

If Warrant Shares are issued in such a cashless exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the Securities Act, the Warrant Shares shall take on the characteristics of the Warrants being exercised, and the holding period of the Warrant Shares being issued may be tacked on to the holding period of this Warrant. The Company agrees not to take any position contrary to this Section 1(f).

(g) Rescission Rights. If the Company fails to cause the Transfer Agent to transmit to the Holder the Warrant Shares pursuant to Section 1(a) by the Share Delivery Date, then the Holder will have the right to rescind such exercise provided that such rescission shall not affect the Company’s obligations to make any payments pursuant to Section 1(e) which have accrued prior to the date of such rescission.

(h) Disputes. In the case of a dispute as to the determination of the Exercise Price or the arithmetic calculation of the Warrant Shares, the Company shall promptly issue to the Holder the number of Warrant Shares that are not disputed and resolve such dispute in accordance with Section 14.

(i) **Limitations on Exercises - Beneficial Ownership.*** Notwithstanding anything to the contrary contained herein, the Company shall not effect the exercise of any portion of this Warrant, and the Holder shall not have the right to exercise any portion of this Warrant, pursuant to the terms and conditions of this Warrant and any such exercise shall be null and void and treated as if never made, to the extent that after giving effect to such exercise, the Holder together with the other Attribution Parties collectively would beneficially own in excess of [4.99][9.99]% (the "**Maximum Percentage**") of the number of shares of Common Stock outstanding immediately after giving effect to such exercise. For purposes of the foregoing sentence, the aggregate number of shares of Common Stock beneficially owned by the Holder and the other Attribution Parties shall include the number of shares of Common Stock held by the Holder and all other Attribution Parties plus the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which the determination of such sentence is being made, but shall exclude the number of shares of Common Stock which would be issuable upon (A) exercise of the remaining, unexercised portion of this Warrant beneficially owned by the Holder or any of the other Attribution Parties and (B) exercise or conversion of the unexercised or unconverted portion of any other securities of the Company (including, without limitation, any convertible notes or convertible preferred stock or warrants, including the other Warrants) beneficially owned by the Holder or any other Attribution Party subject to a limitation on conversion or exercise analogous to the limitation contained in this Section 1(f). For purposes of this Section 1(f), beneficial ownership shall be calculated in accordance with Section 13(d) of the Securities Exchange Act of 1934, as amended (the "**1934 Act**"). For purposes of this Warrant, in determining the number of outstanding shares of Common Stock the Holder may acquire upon the exercise of this Warrant without exceeding the Maximum Percentage, the Holder may rely on the number of outstanding shares of Common Stock as reflected in (x) the Company's most recent Annual Report on Form 10-K, Quarterly Report on Form 10-Q and Current Reports on Form 8-K or other public filing with the Securities and Exchange Commission (the "**SEC**"), as the case may be, (y) a more recent public announcement by the Company or (3) any other written notice by the Company or the Transfer Agent setting forth the number of shares of Common Stock outstanding (the "**Reported Outstanding Share Number**"). If the Company receives an Exercise Notice from the Holder at a time when the actual number of outstanding shares of Common Stock is less than the Reported Outstanding Share Number, the Company shall (i) notify the Holder in writing of the number of shares of Common Stock then outstanding and, to the extent that such Exercise Notice would otherwise cause the Holder's beneficial ownership, as determined pursuant to this Section 1(f), to exceed the Maximum Percentage, the Holder must notify the Company of a reduced number of Warrant Shares to be purchased pursuant to such Exercise Notice (the number of shares by which such purchase is reduced, the "**Reduction Shares**") and (ii) as soon as reasonably practicable, the Company shall return to the Holder any exercise price paid by the Holder for the Reduction Shares. For any reason at any time, upon the written or oral request of the Holder, the Company shall within one (1) Business Day confirm orally and in writing or by electronic mail to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder and any other Attribution Party since the date as of which the Reported Outstanding Share Number was reported. In the event that the issuance of Common Stock to the Holder upon exercise of this Warrant results in the Holder and the other Attribution Parties being deemed to beneficially own, in the aggregate, more than the Maximum Percentage of the number of outstanding shares of Common Stock (as determined under Section 13(d) of the 1934 Act), the number of shares so issued by which the Holder's and the other Attribution Parties' aggregate beneficial ownership exceeds the Maximum Percentage (the "**Excess Shares**") shall be deemed null and void and shall be cancelled ab initio, and the Holder shall not have the power to vote or to transfer the Excess Shares. As soon as reasonably practicable after the issuance of the Excess Shares has been deemed null and void, the Company shall return to the Holder the exercise price paid by the Holder for the Excess Shares. Upon delivery of a written notice to the Company, the Holder may from time to time increase or decrease the Maximum Percentage to any other percentage not in excess of 9.99% as specified in such notice; provided that (i) any such increase in the Maximum Percentage will not be effective until the sixty-first (61st) day after such notice is delivered to the Company and (ii) any such increase or decrease will apply only to the Holder and the other Attribution Parties and not to any other holder of Warrants that is not an Attribution Party of the Holder. For purposes of clarity, the shares of Common Stock issuable pursuant to the terms of this Warrant in excess of the Maximum Percentage shall not be deemed to be beneficially owned by the Holder for any purpose including for purposes of Section 13(d) or Rule 16a-1(a)(1) of the 1934 Act. No prior inability to exercise this Warrant pursuant to this paragraph shall have any effect on the applicability of the provisions of this paragraph with respect to any subsequent determination of exercisability. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 1(f) to the extent necessary to correct this paragraph or any portion of this paragraph which may be defective or inconsistent with the intended beneficial ownership limitation contained in this Section 1(f) or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitation contained in this paragraph may not be waived and shall apply to a successor holder of this Warrant.

* Not applicable to all Holders.

(j) Reservation of Warrant Shares. The Company covenants that it will at all times reserve and keep available out of the aggregate of its authorized but unissued and otherwise unreserved Common Stock, solely for the purpose of enabling it to issue Warrant Shares upon exercise of this Warrant as herein provided, the number of Warrant Shares which are then issuable and deliverable upon the exercise of this entire Warrant, free from preemptive rights or any other contingent purchase rights of persons other than the Holder (after giving effect to the adjustments and restrictions of Section 2, if any). The Company covenants that all Warrant Shares so issuable and deliverable shall, upon issuance and the payment of the applicable Exercise Price in accordance with the terms hereof, be duly and validly authorized, issued and fully paid and nonassessable and free from all taxes, liens and charges created by the Company in respect of the issue thereof (other than taxes in respect of any transfer occurring contemporaneously with such issue). The Company will take all such action as may be necessary to assure that such shares of Common Stock may be issued as provided herein without violation of any applicable law or regulation, or of any requirements of any securities exchange or automated quotation system upon which the Common Stock may be listed.

(k) Voluntary Adjustment By Company. The Company may at any time during the term of this Warrant reduce the then current Exercise Price to any amount and for any period of time deemed appropriate by the Board of Directors of the Company.

2. ADJUSTMENT OF EXERCISE PRICE AND NUMBER OF WARRANT SHARES UPON SUBDIVISION OR COMBINATION OF SHARES OF COMMON STOCK. If the Company at any time on or after the Subscription Date subdivides (by any stock split, stock dividend, recapitalization or otherwise) one or more classes of its outstanding shares of Common Stock into a greater number of shares, the Exercise Price in effect immediately prior to such subdivision will be proportionately reduced and the number of Warrant Shares will be proportionately increased. If the Company at any time on or after the Subscription Date combines (by combination, reverse stock split or otherwise) one or more classes of its outstanding shares of Common Stock into a smaller number of shares, the Exercise Price in effect immediately prior to such combination will be proportionately increased and the number of Warrant Shares will be proportionately decreased. Any adjustment under this Section 2 shall become effective at the close of business on the date the subdivision or combination becomes effective.

3. **RIGHTS UPON DISTRIBUTION OF ASSETS.** In addition to any adjustments pursuant to Section 2 above, if, on or after the Subscription Date and on or prior to the Expiration Date, the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property, options, evidence of indebtedness or any other assets by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "**Distribution**"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations or restrictions on exercise of this Warrant, including without limitation, the Maximum Percentage) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, that to the extent that the Holder's right to participate in any such Distribution would result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, then the Holder shall not be entitled to participate in such Distribution to such extent (and shall not be entitled to beneficial ownership of such shares of Common Stock as a result of such Distribution (and beneficial ownership) to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time or times as its right thereto would not result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times the Holder shall be granted such Distribution (and any Distributions declared or made on such initial Distribution or on any subsequent Distribution held similarly in abeyance) to the same extent as if there had been no such limitation).

4. **PURCHASE RIGHTS; FUNDAMENTAL TRANSACTIONS; CHANGE OF CONTROL.**

(a) **Purchase Rights.** In addition to any adjustments pursuant to Section 2 above, if at any time on or after the Subscription Date and on or prior to the Expiration Date the Company grants, issues or sells any Options, Convertible Securities or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of Common Stock (the "**Purchase Rights**"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations or restrictions on exercise of this Warrant, including without limitation, the Maximum Percentage) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of Common Stock are to be determined for the grant, issuance or sale of such Purchase Rights (provided, however, that to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, then the Holder shall not be entitled to participate in such Purchase Right to such extent (and shall not be entitled to beneficial ownership of such Common Stock as a result of such Purchase Right (and beneficial ownership) to such extent) and such Purchase Right to such extent shall be held in abeyance for the benefit of the Holder until such time or times as its right thereto would not result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times the Holder shall be granted such right (and any Purchase Right granted, issued or sold on such initial Purchase Right or on any subsequent Purchase Right to be held similarly in abeyance) to the same extent as if there had been no such limitation).

(b) **Fundamental Transactions.** The Company shall not enter into or be party to a Fundamental Transaction unless the Successor Entity assumes in writing all of the obligations of the Company under this Warrant and the other Transaction Documents (as defined in the Securities Purchase Agreement) in accordance with the provisions of this Section 4(b), including agreements to deliver to each holder of the SPA Warrants in exchange for such Warrants a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Warrant, including, without limitation, an adjusted exercise price equal to the value for the shares of Common Stock reflected by the terms of such Fundamental Transaction, and exercisable for a corresponding number of shares of capital stock equivalent to the shares of Common Stock acquirable and receivable upon exercise of this Warrant (without regard to any limitations on the exercise of this Warrant) prior to such Fundamental Transaction. Upon the occurrence of any Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Warrant referring to the "Company" shall refer instead to the Successor Entity), and may exercise every right and power of the Company and shall assume all of the obligations of the Company under this Warrant with the same effect as if such Successor Entity had been named as the Company herein. Upon consummation of the Fundamental Transaction, the Successor Entity shall deliver to the Holder confirmation that there shall be issued upon exercise of this Warrant at any time after the consummation of the Fundamental Transaction, in lieu of the shares of Common Stock (or other securities, cash, assets or other property) issuable upon the exercise of the Warrant prior to such Fundamental Transaction, such shares of the publicly traded common stock or common shares (or its equivalent) of the Successor Entity (including its Parent Entity) which the Holder would have been entitled to receive upon the happening of such Fundamental Transaction had this Warrant been converted immediately prior to such Fundamental Transaction, as adjusted in accordance with the provisions of this Warrant. In addition to and not in substitution for any other rights hereunder, prior to the consummation of any Fundamental Transaction pursuant to which holders of shares of Common Stock are entitled to receive securities or other assets with respect to or in exchange for shares of Common Stock (a "**Corporate Event**"), the Company shall make appropriate provision to insure that the Holder will thereafter have the right to receive upon an exercise of this Warrant at any time after the consummation of the Corporate Event but prior to the Expiration Date, in lieu of shares of Common Stock (or other securities, cash, assets or other property) purchasable upon the exercise of this Warrant prior to such Corporate Event, such shares of stock, securities, cash, assets or any other property whatsoever (including warrants or other purchase or subscription rights) which the Holder would have been entitled to receive upon the happening of such Corporate Event had this Warrant been exercised immediately prior to such Corporate Event. The provisions of this Section shall apply similarly and equally to successive Fundamental Transactions and Corporate Events and shall be applied without regard to any limitations on the exercise of this Warrant. Notwithstanding anything to the contrary, in the event of a Fundamental Transaction, the Company or any Successor Entity shall, at the Holder's option, exercisable at any time concurrently with, or within 30 days after, the consummation of the Fundamental Transaction, purchase this Warrant from the Holder by paying to the Holder an amount of cash equal to the Black Scholes Value of the remaining unexercised portion of this Warrant on the effective date of the Fundamental Transaction. "**Black Scholes Value**" means the value of the unexercised portion of the Warrant remaining on the effective date of the Fundamental Transaction which value is calculated using the Black Scholes Option Pricing Model obtained from the "OV" function on Bloomberg, L.P. utilizing (i) an underlying price per share equal to the greater of (1) the Closing Sale Price on the Trading Day immediately following the public disclosure of the applicable Fundamental Transaction and (2) the sum of the price per share being offered in cash in the applicable Fundamental Transaction (if any) plus the value of the non-cash consideration being offered in the applicable Fundamental Transaction (if any), (ii) a strike price equal to the exercise price in effect on the effective date of the Fundamental Transaction, (iii) a risk-free interest rate corresponding to the U.S. Treasury rate for a period equal to the remaining term of the Warrant as of the Trading Day immediately following the public disclosure of the applicable Fundamental Transaction, (iv) a zero cost of borrow, (v) a remaining option time equal to the time between the Trading Day immediately following the public disclosure of the applicable Fundamental Transaction and the Expiration Date and (vi) an expected volatility equal to the greater of 60% and the 90 day volatility obtained from the "HVT" function on Bloomberg, L.P. (determined utilizing a 365 day annualization factor) as of the Trading Day immediately following the public disclosure of the applicable Fundamental Transaction.

(c) Change of Control. Notwithstanding the foregoing, in the event of a Change of Control other than one in which a Successor Entity that is a publicly traded corporation whose stock is quoted or listed for trading on an Eligible Market assumes this Warrant such that the Warrant shall be exercisable for the publicly traded common stock of such Successor Entity, at the request of the Holder delivered before the ninetieth (90th) day after the consummation of such Change of Control, the Company (or the Successor Entity) shall purchase this Warrant from the Holder by paying to the Holder, within five (5) Business Days after such request (or, if later, on the effective date of the Fundamental Transaction), cash in an amount equal to the Black Scholes Value of the remaining unexercised portion of this Warrant on the date of such Change of Control.

5. NONCIRCUMVENTION. The Company hereby covenants and agrees that the Company will not, by amendment of its governing documents, or through any reorganization, transfer of assets, consolidation, merger, scheme of arrangement, dissolution, issue or sale of securities, or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, and will at all times in good faith carry out all the provisions of this Warrant and take all action as may be required to protect the rights of the Holder. Without limiting the generality of the foregoing, the Company (i) shall not increase the par value of any shares of Common Stock receivable upon the exercise of this Warrant above the Exercise Price then in effect, (ii) shall take all such actions as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and nonassessable shares of Common Stock upon the exercise of this Warrant, and (iii) shall, so long as any of the SPA Warrants are outstanding, take all action necessary to reserve and keep available out of its authorized and unissued shares of Common Stock, solely for the purpose of effecting the exercise of the SPA Warrants, the number of shares of Common Stock as shall from time to time be necessary to effect the exercise of the SPA Warrants then outstanding (without regard to any limitations on exercise). The Company will not close its stockholder books or records in any manner which prevents the timely exercise of this Warrant, pursuant to the terms hereof.

6. WARRANT HOLDER NOT DEEMED A STOCKHOLDER. Except as otherwise specifically provided herein, the Holder, solely in such Person's capacity as a holder of this Warrant, shall not be entitled to vote or receive dividends or be deemed the holder of share capital of the Company for any purpose, nor shall anything contained in this Warrant be construed to confer upon the Holder, solely in such Person's capacity as the Holder of this Warrant, any of the rights of a stockholder of the Company or any right to vote, give or withhold consent to any corporate action (whether any reorganization, issue of stock, reclassification of stock, consolidation, merger, conveyance or otherwise), receive notice of meetings, receive dividends or subscription rights, or otherwise, prior to the issuance to the Holder of the Warrant Shares which such Person is then entitled to receive upon the due exercise of this Warrant. In addition, nothing contained in this Warrant shall be construed as imposing any liabilities on the Holder to purchase any securities (upon exercise of this Warrant or otherwise) or as a stockholder of the Company, whether such liabilities are asserted by the Company or by creditors of the Company. Notwithstanding this Section 6, the Company shall provide the Holder with copies of the same notices and other information given to the stockholders of the Company generally, contemporaneously with the giving thereof to the stockholders, unless such notices or other information is contained in the SEC Reports.

7. REISSUANCE OF WARRANTS.

(a) Transfer of Warrant. If this Warrant is to be transferred, the Holder shall surrender this Warrant to the Company, whereupon the Company will forthwith issue and deliver upon the order of the Holder a new Warrant (in accordance with Section 7(d)), registered as the Holder may request, representing the right to purchase the number of Warrant Shares being transferred by the Holder and, if less than the total number of Warrant Shares then underlying this Warrant is being transferred, a new Warrant (in accordance with Section 7(d)) to the Holder representing the right to purchase the number of Warrant Shares not being transferred.

(b) Lost, Stolen or Mutilated Warrant. Upon receipt by the Company of evidence reasonably satisfactory to the Company of the loss, theft, destruction or mutilation of this Warrant, and, in the case of loss, theft or destruction, of any indemnification undertaking by the Holder to the Company in customary form and, in the case of mutilation, upon surrender and cancellation of this Warrant, the Company shall execute and deliver to the Holder a new Warrant (in accordance with Section 7(d)) representing the right to purchase the Warrant Shares then underlying this Warrant.

(c) Exchangeable for Multiple Warrants. This Warrant is exchangeable, upon the surrender hereof by the Holder at the principal office of the Company, for a new Warrant or Warrants (in accordance with Section 7(d)) representing in the aggregate the right to purchase the number of Warrant Shares then underlying this Warrant, and each such new Warrant will represent the right to purchase such portion of such Warrant Shares as is designated by the Holder at the time of such surrender.

(d) Issuance of New Warrants. Whenever the Company is required to issue a new Warrant pursuant to the terms of this Warrant, such new Warrant (i) shall be of like tenor with this Warrant, (ii) shall represent, as indicated on the face of such new Warrant, the right to purchase the Warrant Shares then underlying this Warrant (or in the case of a new Warrant being issued pursuant to Section 7(a) or Section 7(c), the Warrant Shares designated by the Holder which, when added to the number of shares of Common Stock underlying the other new Warrants issued in connection with such issuance, does not exceed the number of Warrant Shares then underlying this Warrant), (iii) shall have an issuance date, as indicated on the face of such new Warrant which is the same as the Issuance Date, and (iv) shall have the same rights and conditions as this Warrant.

8. NOTICES. Whenever notice is required to be given under this Warrant, unless otherwise provided herein, such notice shall be given in accordance with Section 6.4 of the Securities Purchase Agreement. The Company shall provide the Holder with prompt written notice of all actions taken pursuant to this Warrant, including in reasonable detail a description of such action and the reason therefor. Without limiting the generality of the foregoing, the Company will give written notice to the Holder (i) immediately upon any adjustment of the Exercise Price, setting forth in reasonable detail, and certifying, the calculation of such adjustment and (ii) at least fifteen (15) days prior to the date on which the Company closes its books or takes a record (A) with respect to any dividend or distribution upon the shares of Common Stock, (B) with respect to any grants, issuances or sales of Purchase Rights or (C) for determining rights to vote with respect to any Fundamental Transaction, dissolution or liquidation, provided in each case that such information shall be made known to the public prior to or in conjunction with such notice being provided to the Holder.

9. **AMENDMENT AND WAIVER.** Except as otherwise provided herein, the provisions of this Warrant may be amended and the Company may take any action herein prohibited, or omit to perform any act herein required to be performed by it, only if the Company has obtained the written consent of the Required Holders; provided that no such action may increase the exercise price of any SPA Warrant or decrease the number of shares or class of stock obtainable upon exercise of any SPA Warrant without the written consent of the Holder. No such amendment shall be effective to the extent that it applies to less than all of the holders of the SPA Warrants then outstanding.

10. **NONWAIVER AND EXPENSES.** No course of dealing or any delay or failure to exercise any right hereunder on the part of Holder shall operate as a waiver of such right or otherwise prejudice the Holder's rights, powers or remedies, notwithstanding the fact that all rights hereunder terminate on the Termination Date. If the Company willfully and knowingly fails to comply with any provision of this Warrant, which results in any material damages to the Holder, the Company shall pay to the Holder such amounts as shall be sufficient to cover any costs and expenses including, but not limited to, reasonable attorneys' fees, including those of appellate proceedings, incurred by the Holder in collecting any amounts due pursuant hereto or in otherwise enforcing any of its rights, powers or remedies hereunder.

11. **LIMITATION OF LIABILITY.** No provision hereof, in the absence of any affirmative action by the Holder to exercise this Warrant to purchase Warrant Shares, and no enumeration herein of the rights or privileges of the Holder, shall give rise to any liability of the Holder for the purchase price of any Common Stock or as a stockholder of the Company, whether such liability is asserted by the Company or by creditors of the Company.

12. **GOVERNING LAW.** This Warrant shall be governed by and construed and enforced in accordance with, and all questions concerning the construction, validity, interpretation and performance of this Warrant shall be governed by, the internal laws of the State of New York, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of New York or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of New York. The Company hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in The City of New York, Borough of Manhattan, for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. The Company hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof to the Company at the address set forth in Section 8(i) above or such other address as the Company subsequently delivers to the Holder and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. Nothing contained herein shall be deemed to operate to preclude the Holder from bringing suit or taking other legal action against the Company in any other jurisdiction to collect on the Company's obligations to the Holder, to realize on any collateral or any other security for such obligations, or to enforce a judgment or other court ruling in favor of the Holder. **THE COMPANY HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION WITH OR ARISING OUT OF THIS WARRANT OR ANY TRANSACTION CONTEMPLATED HEREBY.**

13. CONSTRUCTION; HEADINGS. This Warrant shall be deemed to be jointly drafted by the Company and all the Buyers and shall not be construed against any person as the drafter hereof. The headings of this Warrant are for convenience of reference and shall not form part of, or affect the interpretation of, this Warrant.

14. DISPUTE RESOLUTION. In the case of a dispute as to the determination of the Exercise Price or the arithmetic calculation of the Warrant Shares, the Company shall submit the disputed determinations or arithmetic calculations via facsimile or electronic mail within two (2) Business Days of receipt of the Exercise Notice giving rise to such dispute, as the case may be, to the Holder. If the Holder and the Company are unable to agree upon such determination or calculation of the Exercise Price or the Warrant Shares within three (3) Business Days of such disputed determination or arithmetic calculation being submitted to the Holder, then the Company shall, within two (2) Business Days submit via facsimile or electronic mail (a) the disputed determination of the Exercise Price to an independent, reputable investment bank selected by the Company and approved by the Holder or (b) the disputed arithmetic calculation of the Warrant Shares to the Company's independent, outside accountant. The Company shall cause at its expense the investment bank or the accountant, as the case may be, to perform the determinations or calculations and notify the Company and the Holder of the results no later than ten Business Days from the time it receives the disputed determinations or calculations. Such investment bank's or accountant's determination or calculation, as the case may be, shall be binding upon all parties absent demonstrable error.

15. REMEDIES, OTHER OBLIGATIONS, BREACHES AND INJUNCTIVE RELIEF. The remedies provided in this Warrant shall be cumulative and in addition to all other remedies available under this Warrant and the other Transaction Documents, at law or in equity (including a decree of specific performance and/or other injunctive relief), and nothing herein shall limit the right of the Holder to pursue actual damages for any failure by the Company to comply with the terms of this Warrant. The Company acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Holder and that the remedy at law for any such breach may be inadequate. The Company therefore agrees that, in the event of any such breach or threatened breach, the holder of this Warrant shall be entitled, in addition to all other available remedies, to an injunction restraining any breach, without the necessity of showing economic loss and without any bond or other security being required.

16. TRANSFER. This Warrant may be offered for sale, sold, transferred or assigned without the consent of the Company, except as may otherwise be required by Section 4.1 of the Securities Purchase Agreement.

17. SUCCESSORS AND ASSIGNS. Subject to applicable securities laws, this Warrant and the rights and obligations evidenced hereby shall inure to the benefit of and be binding upon the successors and permitted assigns of the Company and the successors and permitted assigns of Holder. The provisions of this Warrant are intended to be for the benefit of any Holder from time to time of this Warrant and shall be enforceable by the Holder or holder of Warrant Shares.

18. SEVERABILITY. If any provision of this Warrant is prohibited by law or otherwise determined to be invalid or unenforceable by a court of competent jurisdiction, the provision that would otherwise be prohibited, invalid or unenforceable shall be deemed amended to apply to the broadest extent that it would be valid and enforceable, and the invalidity or unenforceability of such provision shall not affect the validity of the remaining provisions of this Warrant so long as this Warrant as so modified continues to express, without material change, the original intentions of the parties as to the subject matter hereof and the prohibited nature, invalidity or unenforceability of the provision(s) in question does not substantially impair the respective expectations or reciprocal obligations of the parties or the practical realization of the benefits that would otherwise be conferred upon the parties. The parties will endeavor in good faith negotiations to replace the prohibited, invalid or unenforceable provision(s) with a valid provision(s), the effect of which comes as close as possible to that of the prohibited, invalid or unenforceable provision(s).

19. HEADINGS. The headings used in this Warrant are for the convenience of reference only and shall not, for any purpose, be deemed a part of this Warrant

20. CERTAIN DEFINITIONS. Capitalized terms used and not otherwise defined herein shall have the meanings set forth in that certain Securities Purchase Agreement. For purposes of this Warrant, the following terms shall have the following meanings:

(a) "**Attribution Parties**" means, collectively, the following Persons and entities: (i) any investment vehicle, including, any funds, feeder funds or managed accounts, currently, or from time to time after the Subscription Date, directly or indirectly managed or advised by the Holder's investment manager or any of its Affiliates or principals, (ii) any direct or indirect Affiliates of the Holder or any of the foregoing, (iii) any Person acting or who could be deemed to be acting as a Group together with the Holder or any of the foregoing and (iv) any other Persons whose beneficial ownership of the Company's Common Stock would or could be aggregated with the Holder's and the other Attribution Parties for purposes of Section 13(d) of the 1934 Act. For clarity, the purpose of the foregoing is to subject collectively the Holder and all other Attribution Parties to the Maximum Percentage.

(b) "**Bloomberg**" means Bloomberg Financial Markets.

(c) "**Business Day**" means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed.

(d) "**Change of Control**" means any Fundamental Transaction other than (i) any reorganization, recapitalization or reclassification of the Common Stock in which holders of the Company's voting power immediately prior to such reorganization, recapitalization or reclassification continue after such reorganization, recapitalization or reclassification to hold publicly traded securities and, directly or indirectly, the voting power of the surviving entity or entities necessary to elect a majority of the members of the board of directors (or their equivalent if other than a corporation) of such entity or entities, or (ii) pursuant to a migratory merger effected solely for the purpose of changing the jurisdiction of incorporation of the Company.

(e) "**Closing Bid Price**" and "**Closing Sale Price**" means, for any security as of any date, the consolidated closing bid price and lowest closing trade price, respectively, for such security on the Principal Market, as reported by Bloomberg, or, if the Principal Market begins to operate on an extended hours basis and does not designate the closing bid price or the closing trade price, as the case may be, then the last bid price or the last trade price, respectively, of such security prior to 4:00:00 p.m., New York time, as reported by Bloomberg, or, if the Principal Market is not the principal securities exchange or trading market for such security, the consolidated closing bid price or last trade price, respectively, of such security on the principal securities exchange or trading market where such security is listed or traded as reported by Bloomberg, or if the foregoing do not apply, the consolidated closing bid price or last trade price, respectively, of such security in the over-the-counter market on the electronic bulletin board for such security as reported by Bloomberg, or, if no closing bid price or last trade price, respectively, is reported for such security by Bloomberg, the average of the bid prices, or the ask prices, respectively, of any market makers for such security as reported in the "pink sheets" by Pink Sheets LLC (formerly the National Quotation Bureau, Inc.). If the Closing Bid Price or the Closing Sale Price cannot be calculated for a security on a particular date on any of the foregoing bases, the Closing Bid Price or the Closing Sale Price, as the case may be, of such security on such date shall be the fair market value as mutually determined by the Company and the Holder. If the Company and the Holder are unable to agree upon the fair market value of such security, then such dispute shall be resolved pursuant to Section 12. All such determinations to be appropriately adjusted for any stock dividend, stock split, stock combination or other similar transaction during the applicable calculation period.

(f) "**Common Stock**" means (i) the Company's shares of Common Stock, par value \$0.01 per share, and (ii) any share capital into which such Common Stock shall have been changed or any share capital resulting from a reclassification of such Common Stock.

(g) "**Common Stock Equivalents**" means any securities of the Company which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, right, option, warrant or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

(h) "**Convertible Securities**" means any stock or securities (other than Options) directly or indirectly convertible into or exercisable or exchangeable for shares of Common Stock.

(i) "**Eligible Market**" means the Principal Market, and any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: The New York Stock Exchange, Inc., The NYSE MKT, The NASDAQ Global Select Market, or The NASDAQ Global Market (or any successors to any of the foregoing).

(j) "**Expiration Date**" means the date 5 years after the Subscription Date or, if such date falls on a day other than a Business Day or on which trading does not take place on the Principal Market (a "**Holiday**"), the next day that is not a Holiday.

(k) "**Fundamental Transaction**" means (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another person, (ii) the Company, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or more related transactions, (iii) any direct or indirect purchase offer, tender offer or exchange offer (whether by the Company or another person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock, (iv) the Company, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spinoff or scheme of arrangement) with another person or group of persons whereby such other person or group acquires more than 50% of the outstanding shares of Common Stock (not including any shares of Common Stock held by the other person or other persons making or party to, or associated or affiliated with, the other persons making or party to such stock or share purchase agreement or other business combination).

(l) "**Initial Exercisability Date**" means the 90 days after the Subscription Date.

(m) "**Options**" means any rights, warrants or options to subscribe for or purchase shares of Common Stock or Convertible Securities.

(n) "**Parent Entity**" of a Person means an entity that, directly or indirectly, controls the applicable Person and whose common shares or common stock or equivalent equity security is quoted or listed on an Eligible Market, or, if there is more than one such Person or Parent Entity, the Person or Parent Entity with the largest public market capitalization as of the date of consummation of the Fundamental Transaction.

(o) "**Person**" means an individual, a limited liability company, a partnership, a joint venture, a corporation, a trust, an unincorporated organization, any other entity and a government or any department or agency thereof.

(p) "**Principal Market**" means NASDAQ Capital Market.

(q) "**Required Holders**" means the holders of the SPA Warrants representing at least 67% of the shares of Common Stock underlying the SPA Warrants then outstanding.

(r) "**Successor Entity**" means the Person (or, if so elected by the Required Holders, the Parent Entity) formed by, resulting from or surviving any Fundamental Transaction or the Person (or, if so elected by the Required Holders, the Parent Entity) with which such Fundamental Transaction shall have been entered into.

(s) "**Trading Day**" means (a) any day on which the Common Stock is listed or quoted and traded on its primary Trading Market, or (b) if the Common Stock is not then listed or quoted and traded on its primary Trading Market, then a day on which trading of the Common Stock occurs on another Trading Market, or (c) if the Common Stock is not listed or quoted as set forth in clauses (a) or (b) hereof, any Business Day.

[Signature Page Follows]

IN WITNESS WHEREOF, the Company has caused this Warrant to Purchase Common Stock to be duly executed as of the Issuance Date set out above.

OPGEN, INC.

By: _____
Name:
Title:

**EXERCISE NOTICE
TO BE EXECUTED BY THE REGISTERED HOLDER TO EXERCISE THIS
WARRANT TO PURCHASE COMMON STOCK**

OPGEN, INC.

The undersigned holder hereby exercises the right to purchase _____ of the Common Stock ("**Warrant Shares**") of OpGen, Inc., a company organized under the laws of Delaware (the "**Company**"), evidenced by the attached Warrant to Purchase Common Stock (the "**Warrant**"). Capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Warrant.

1. Form of Exercise Price. The Holder intends that payment of the Exercise Price shall be made as:

- _____ a "Cash Exercise" with respect to _____ Warrant Shares; and/or
- _____ a "Cashless Exercise" with respect to _____ Warrant Shares.

2. Payment of Exercise Price. In the event that the holder has elected a Cash Exercise with respect to some or all of the Warrant Shares to be issued pursuant hereto, the holder shall pay the Aggregate Exercise Price in the sum of \$ _____ to the Company in accordance with the terms of the Warrant.

3. Delivery of Warrant Shares. The Company shall deliver to the holder _____ Warrant Shares in accordance with the terms of the Warrant.

[The Warrant Shares shall be delivered to the following DWAC Account Number:

_____]

4. Accredited Investor. The undersigned is an "accredited investor" as defined in Regulation D promulgated under the Securities Act of 1933, as amended.

5. [Notwithstanding anything to the contrary contained herein, this Exercise Notice shall constitute a representation by the Holder of the Warrant submitting this Exercise Notice that, after giving effect to the exercise provided for in this Exercise Notice, such Holder (together with its affiliates) will not have beneficial ownership (together with the beneficial ownership of such Person's affiliates) of a number of shares of Common Stock which exceeds the Maximum Percentage (as defined in the Warrant) of the total outstanding shares of Common Stock of the Company as determined pursuant to the provisions of Section 1(i) of the Warrant.]

Date: _____, _____

Name of Registered Holder

By: _____
Name:
Title:



ASSIGNMENT FORM

(To assign the foregoing Warrant, execute this form and supply required information. Do not use this form to purchase shares.)

FOR VALUE RECEIVED, the foregoing Warrant and all rights evidenced thereby are hereby assigned to

Name: _____
(Please Print)

Address: _____
(Please Print)

Phone Number: _____

Email Address: _____

Dated: _____

Holder's Signature: _____

Holder's Address: _____

ACKNOWLEDGMENT

The Company hereby acknowledges this Exercise Notice and hereby directs Philadelphia Stock Transfer, Inc. to issue the above indicated number of shares of Common Stock in accordance with the Transfer Agent Instructions dated [_____, 20[] from the Company and acknowledged and agreed to Philadelphia Stock Transfer, Inc..

OpGen, Inc.

By: _____
Name:
Title:

SECURITIES PURCHASE AGREEMENT

This Securities Purchase Agreement (this "Agreement") is dated as of May 12, 2016, between OpGen, Inc., a Delaware corporation (the "Company"), and each purchaser identified on the signature pages hereto (each, including its successors and assigns, a "Purchaser" and, collectively, the "Purchasers").

WHEREAS, subject to the terms and conditions set forth in this Agreement and pursuant to Section 4(a)(2) of the Securities Act of 1933, as amended (the "Securities Act"), and Rule 506 of Regulation D as promulgated by the United States Securities and Exchange Commission (the "Commission") under the Securities Act, the Company desires to issue and sell to each Purchaser, and each Purchaser, severally and not jointly, desires to purchase from the Company, securities of the Company as more fully described in this Agreement.

NOW, THEREFORE, IN CONSIDERATION of the mutual covenants contained in this Agreement, and for other good and valuable consideration, the receipt and adequacy of which are hereby acknowledged, the Company and each Purchaser agree as follows:

ARTICLE I. DEFINITIONS

1.1 Definitions. In addition to the terms defined elsewhere in this Agreement, for all purposes of this Agreement, the following terms have the meanings set forth in this Section 1.1:

"Acquiring Person" shall have the meaning ascribed to such term in Section 4.5.

"Action" shall have the meaning ascribed to such term in Section 3.1(j).

"Additional Filing Date" means the later of (i) the date sixty (60) days after the date substantially all of the Registrable Securities registered under the immediately preceding Registration Statement are sold and (ii) the date six (6) months from the effective date of the immediately preceding Registration Statement, or, if such date is not a Business Day, the next date that is a Business Day.

"Additional Registration Statement" has the meaning set forth in Section 5.1(a).

"Additional Required Effectiveness Date" means the date which is the earliest of (i) if the Registration Statement does not become subject to review by the Commission, (a) sixty (60) days after the Additional Filing Date or (b) five (5) Trading Days after the Company receives notification from the Commission that the Additional Registration Statement will not become subject to review and the Company fails to request to accelerate the effectiveness of the Registration Statement, or (ii) if the Additional Registration Statement becomes subject to review by the Commission, ninety (90) days after the Additional Filing Date, or, if such date is not a Business Day, the next date that is a Business Day.

"Advisors" means Cowen and Company, LLC as lead placement agent, Leerink Partners LLC as financial advisor and Maxim Group LLC as co-placement agent.

“Affiliate” means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 under the Securities Act.

“Approved Stock Plan” means any employee benefit plan which has been approved by the Board of Directors, pursuant to which the Company’s securities may be issued to any employee, officer or director for services provided to the Company.

“Board of Directors” means the board of directors of the Company.

“Business Day” means any day except any Saturday, any Sunday, any day which is a federal legal holiday in the United States or any day on which banking institutions in the State of New York are authorized or required by law or other governmental action to close.

“CLIA” means the Clinical Laboratories Improvement Act of 1967, as amended.

“Closing” means the Primary Closing or the Secondary Closing, as applicable.

“Closing Bid Price” and “Closing Sale Price” means, for any security as of any date, the consolidated closing bid price and lowest closing trade price, respectively, for such security on the Trading Market, as reported by Bloomberg, or, if the Trading Market begins to operate on an extended hours basis and does not designate the closing bid price or the closing trade price, as the case may be, then the last bid price or the last trade price, respectively, of such security prior to 4:00:00 p.m., New York time, as reported by Bloomberg, or, if the Trading Market is not the principal securities exchange or trading market for such security, the consolidated closing bid price or last trade price, respectively, of such security on the principal securities exchange or trading market where such security is listed or traded as reported by Bloomberg, or if the foregoing do not apply, the consolidated closing bid price or last trade price, respectively, of such security in the over-the-counter market on the electronic bulletin board for such security as reported by Bloomberg, or, if no closing bid price or last trade price, respectively, is reported for such security by Bloomberg, the average of the bid prices, or the ask prices, respectively, of any market makers for such security as reported in the “pink sheets” by Pink Sheets LLC or its successors (formerly the National Quotation Bureau, Inc.). If the Closing Bid Price or the Closing Sale Price cannot be calculated for a security on a particular date on any of the foregoing bases, the Closing Bid Price or the Closing Sale Price, as the case may be, of such security on such date shall be the fair market value as mutually determined by the Company and the holder of the security. If the Company and the holder of the security are unable to agree upon the fair market value of such security, then such dispute shall be resolved pursuant to Section 6.9. All such determinations to be appropriately adjusted for any stock dividend, stock split, stock combination or other similar transaction during the applicable calculation period.

“Closing Date” means the Primary Closing Date or the Secondary Closing Date, as applicable.

“Closing Statement” means, for each Closing Date, the Closing Statement in the form on Annex A attached hereto.

“Common Stock” means the common stock of the Company, par value \$0.01 per share, and any other class of securities into which such securities may hereafter be reclassified or changed.

“Common Stock Equivalents” means any securities of the Company or the Subsidiaries which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, right, option, warrant or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

“Company Counsel” means Ballard Spahr LLP, with offices located at 1735 Market Street, 51st Floor, Philadelphia, Pennsylvania 19103.

“Convertible Securities” means any stock or securities (other than Options) convertible into or exercisable or exchangeable for Common Stock.

“Disclosure Schedules” shall have the meaning ascribed to such term in Section 3.1.

“EGS” means Ellenoff Grossman & Schole LLP, with offices located at 1345 Avenue of the Americas, New York, New York 10105, as counsel to the Advisors.

“Effective Date” means the earliest of the date that (a) the initial Registration Statement has been declared effective by the Commission, (b) all of the Shares and Warrant Shares have been sold pursuant to Rule 144 or may be sold pursuant to Rule 144 without the requirement for the Company to be in compliance with the current public information required under Rule 144 and without volume or manner-of-sale restrictions, (c) follows the six-month anniversary of the Primary Closing Date, provided that a holder of Shares and Warrant Shares is not an Affiliate of the Company, or (d) all of the Shares and Warrant Shares may be sold pursuant to an exemption from registration under Section 4 of the Securities Act without volume or manner-of-sale restrictions and Company Counsel has delivered to such holders a standing written unqualified opinion that resales may then be made by such holders of the Shares and Warrant Shares pursuant to such exemption, which opinion shall be in form and substance reasonably acceptable to such holders.

“Escrow Agent” means Ballard Spahr LLP, with offices located at 1735 Market Street, 51st Floor, Philadelphia, Pennsylvania 19103.

“Escrow Agreement” means the escrow agreement entered into prior to the date hereof, by and among the Company, the Escrow Agent and Merck Global Health Innovation Fund, LLC pursuant to which Merck Global Health Innovation Fund, LLC shall deposit \$2,784,375.88, representing the purchase price of the Remaining Merck Securities with the Escrow Agent to be applied to the transactions contemplated hereunder.

“Evaluation Date” shall have the meaning ascribed to such term in Section 3.1(s).

“Exchange Act” means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

“Excluded Purchasers” means Cowen and Company, LLC (other than Ramius LLC and any investment funds or managed accounts managed or advised by Ramius LLC), Leerink Partners LLC and their respective Affiliates, Merck Global Health Innovation Fund, LLC, jVen Capital, LLC, Timothy J.R. Harris, Ph.D., D.Sc., Kevin Krenitsky, M.D., Timothy C. Dec, Robert McG. Lilley, Vadim Sapiro and Albert J. Risdorfer.

“Execution Date” means the date of this Agreement.

“Exempt Issuance” means any Common Stock issued or issuable: (i) in connection with any public offering of Common Stock that occurs within twelve (12) months from the Primary Closing Date, (ii) in connection with any Approved Stock Plan (as defined below); (iii) upon exercise of the Warrants; (iv) in connection with any stock split, stock dividend, recapitalization or similar transaction by the Company; (v) upon conversion, exercise or exchange of any Options or Convertible Securities which are outstanding on the day immediately preceding the date hereof, provided that the terms of such Options or Convertible Securities are not amended, modified or changed on or after the date hereof; (vi) in connection with bona fide, strategic transactions, stock acquisitions, mergers, asset acquisitions, joint ventures or similar transactions approved by the Board of Directors occurring after the date hereof in each case with non-affiliated third parties and otherwise on an arm’s-length basis; provided, that, the purpose of such issuance is not to raise capital; or (vii) pursuant to a bona fide firm commitment underwritten public offering which generates gross proceeds to the Company equal to or in excess of \$50,000,000 (other than an “at-the-market offering” as defined in Rule 415(a)(4) under the Securities Act and “equity lines”).

“FCPA” means the Foreign Corrupt Practices Act of 1977, as amended.

“FDA” means the U.S. Food and Drug Administration.

“FDCA” means the Federal Food, Drug and Cosmetic Act of 1938, as amended, and the regulations thereunder.

“Federal Reserve” means the Board of Governors of the Federal Reserve System.

“Filing Date” means the Initial Filing Date and the Additional Filing Date, as applicable.

“FINRA” means the Financial Industry Regulatory Authority, Inc.

“GAAP” shall have the meaning ascribed to such term in Section 3.1(h).

“Indebtedness” shall have the meaning ascribed to such term in Section 3.1(bb).

“Indemnified Party” shall have the meaning ascribed to such term in Section 4.10.

“Initial Filing Date” means sixty (60) days from the Execution Date.

“Initial Required Effectiveness Date” means the date which is the earliest of (i) if the Registration Statement does not become subject to review by the Commission, (a) ninety (90) days after the Execution Date or (b) five (5) Trading Days after the Company receives notification from the Commission that the Registration Statement will not become subject to review and the Company fails to request to accelerate the effectiveness of the Registration Statement, or (ii) if the Registration Statement becomes subject to review by the Commission, one hundred and twenty (120) days after the Execution Date, or, if such date is not a Business Day, the next date that is a Business Day.

“Intellectual Property Rights” shall have the meaning ascribed to such term in Section 3.1(p).

“Laboratory Developed Test” shall have the meaning ascribed to such term in Section 3.1(kk).

“Legend Removal Date” shall have the meaning ascribed to such term in Section 4.1(c).

“Liens” means a lien, charge, pledge, security interest, encumbrance, right of first refusal, preemptive right or other restriction.

“Lock-Up Agreement” means the Lock-Up Agreement, dated as of the date hereof, by and among the Company and the directors, officers, and/or specified stockholders of the Company, in the form of Exhibit F attached hereto.

“Losses” means any and all losses, obligations, claims, contingencies, damages, liabilities, settlement costs, costs and expenses, including, without limitation, all judgments, amounts paid in settlements, court costs and reasonable attorneys’ fees and costs of investigation.

“Marketing Materials” means the OpGen Corporate Presentation dated April 1, 2016 and the Term Sheet.

“Material Adverse Effect” shall have the meaning assigned to such term in Section 3.1(b).

“Material Permits” shall have the meaning ascribed to such term in Section 3.1(n).

“Money Laundering Laws” shall have the meaning set forth in Section 3.1(rr).

“OFAC” means Office of Foreign Assets Control of the U.S. Treasury Department.

“Options” means any outstanding rights, warrants or options to subscribe for or purchase Common Stock or Convertible Securities.

“Per Unit Purchase Price” means the price per Unit to be purchased that shall be based on the Closing Bid Price of the Common Stock on the Trading Market on May 11, 2016, and which equals \$1.14375, subject to adjustment for reverse and forward stock splits, stock dividends, stock combinations and other similar transactions of the Common Stock that occur after the date of this Agreement. The purchase price for each Unit shall be allocated as \$1.05 per Share and \$0.09375 per Warrant.

“Person” means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

“Primary Closing” means the closing of the purchase and sale of the Securities, excluding the Remaining Merck Securities, pursuant to Section 2.1(a).

“Primary Closing Date” means the Trading Day on which all of the Transaction Documents have been executed and delivered by the applicable parties thereto, and all conditions precedent to (i) the Purchasers’ obligations to pay the Subscription Amount for the Securities to be delivered on the Primary Closing Date and (ii) the Company’s obligations to deliver the Securities to be delivered on the Primary Closing Date, in each case, have been satisfied or waived.

“Proceeding” means an action, claim, suit, investigation or proceeding (including, without limitation, an informal investigation or partial proceeding, such as a deposition), whether commenced or threatened.

“Prospectus” means the prospectus included in the Registration Statement (including, without limitation, a prospectus that includes any information previously omitted from a prospectus filed as part of an effective registration statement in reliance upon Rule 430A promulgated under the Securities Act), as amended or supplemented by any prospectus supplement, with respect to the terms of the offering of any portion of the Registrable Securities covered by the Registration Statement, and all other amendments and supplements to the Prospectus including post-effective amendments, and all material incorporated by reference or deemed to be incorporated by reference in such Prospectus.

“Public Information Failure” shall have the meaning ascribed to such term in Section 4.2(b).

“Public Information Failure Payments” shall have the meaning ascribed to such term in Section 4.2(b).

“Registrable Securities” means the Shares and Warrant Shares issued or issuable pursuant to the Transaction Documents, without taking into account any limitations on exercise of the Warrants, together with any securities issued or issuable upon any stock split, dividend or other distribution, recapitalization or similar event with respect to the foregoing.

“Registration Statement” means a registration statement meeting the requirements set forth in this Agreement and covering the resale by the Purchasers of the Shares and Warrant Shares.

“Remaining Merck Securities” means the 2,434,427 Units to be delivered to Merck Global Health Innovation Fund, LLC on the Secondary Closing Date.

“Required Approvals” shall have the meaning ascribed to such term in Section 3.1(e).

“Required Effectiveness Date” means the Initial Required Effectiveness Date and the Additional Required Effectiveness Date, as applicable.

“Rule 144” means Rule 144 promulgated by the Commission pursuant to the Securities Act, as such Rule may be amended or interpreted from time to time, or any similar rule or regulation hereafter adopted by the Commission having substantially the same purpose and effect as such Rule.

“Rule 424” means Rule 424 promulgated by the Commission pursuant to the Securities Act, as such Rule may be amended or interpreted from time to time, or any similar rule or regulation hereafter adopted by the Commission having substantially the same purpose and effect as such Rule.

“SEC Reports” shall have the meaning ascribed to such term in Section 3.1(h).

“Secondary Closing” means the closing of the purchase and sale of the Remaining Merck Securities pursuant to Section 2.1(b).

“Secondary Closing Date” means the Trading Day on which all conditions precedent to (i) the Merck Global Health Innovation Fund, LLC’s obligation to pay the Subscription Amount for the Remaining Merck Securities and (ii) the Company’s obligations to deliver the Remaining Merck Securities, in each case, have been satisfied or waived.

“Securities” means the Units, the Shares, the Warrants and the Warrant Shares, including the Remaining Merck Securities.

“Shareholder Approval” means such approval as may be required by the applicable rules and regulations of the Nasdaq Stock Market (or any successor entity) from the shareholders of the Company with respect to the transactions contemplated by the Transaction Documents, including without limitation the issuance of all of the Securities representing in excess of 19.99% of the issued and outstanding Common Stock (as calculated by the Nasdaq Stock Market) on the applicable Closing Date at a price less than the greater of the book or market value of the Common Stock or any issuance of Securities resulting in a change of control under the rules and regulations of the Nasdaq Stock Market.

“Shares” means the shares of Common Stock underlying the Units and issued or issuable to each Purchaser pursuant to this Agreement.

“Short Sales” means all “short sales” as defined in Rule 200 of Regulation SHO under the Exchange Act (but shall not be deemed to include the location and/or reservation of borrowable shares of Common Stock).

“Subscription Amount” means, as to each Purchaser, the aggregate amount to be paid for the Units purchased hereunder as specified below such Purchaser’s name on the signature page of this Agreement and next to the heading “Subscription Amount,” in United States dollars and in immediately available funds.

“Subsidiary” means any Significant Subsidiary (which for purposes of this Agreement has the meaning ascribed to such term in Regulation S-X under the Exchange Act) of the Company as set forth on Schedule 3.1(a) and shall, where applicable, also include any direct or indirect subsidiary of the Company formed or acquired after the date hereof.

“Term Sheet” means the May 5, 2016 draft term sheet.

“Trading Day” means (a) any day on which the Common Stock is listed or quoted and traded on its primary Trading Market, or (b) if the Common Stock is not then listed or quoted and traded on its primary Trading Market, then a day on which trading of the Common Stock occurs on another Trading Market, or (c) if the Common Stock is not listed or quoted as set forth in clauses (a) or (b) hereof, any Business Day.

“Trading Market” means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: The New York Stock Exchange, Inc., The NYSE MKT, The NASDAQ Global Select Market, The NASDAQ Global Market or The NASDAQ Capital Market (or any successors to any of the foregoing).

“Transaction Documents” means this Agreement, the Warrants, the Lock-Up Agreement, the Escrow Agreement, all exhibits and schedules thereto and hereto and any other documents or agreements executed in connection with the transactions contemplated hereunder.

“Transfer Agent” means Philadelphia Stock Transfer, Inc., the current transfer agent of the Company, with a mailing address of 2320 Haverford Road, Ardmore, Pennsylvania 19003 and a facsimile number of (484) 416-3597, and any successor transfer agent of the Company.

“Unit” means a unit consisting of one Share and one Warrant.

“Variable Rate Transaction” shall have the meaning ascribed to such term in Section 4.12(b).

“Warrants” means, collectively, the Common Stock purchase warrants underlying each Unit, each Warrant to purchase 0.75 of a Share, delivered to the Purchasers in accordance with Section 2.2 hereof, in the form of Exhibit H attached hereto.

“Warrant Shares” means the shares of Common Stock issuable upon exercise of the Warrants.

ARTICLE II. PURCHASE AND SALE

2.1 Closing.

Upon the terms and subject to the conditions set forth herein, the Company agrees to sell, and the Purchasers, severally and not jointly, agree to purchase, up to an aggregate of \$10,355,004.68 of Units.

(a) On the Primary Closing Date, (i) each Purchaser, excluding Merck Global Health Innovation Fund, LLC, shall deliver to the Company, via wire transfer or a certified check, immediately available funds equal to such Purchaser’s Subscription Amount, which shall equal the number of Units set forth on the signature page hereto executed by such Purchaser multiplied by the Price Per Unit, and (ii) Merck Global Health Innovation Fund, LLC, shall deliver (A) to the Company, via wire transfer or a certified check, immediately available funds equal to 1,500,000 Units multiplied by the Per Unit Purchase Price and (B) to the Escrow Agent, via wire transfer or a certified check, \$2,784,375.88 in immediately available funds, representing the purchase price of the Remaining Merck Securities. The Company shall deliver to each Purchaser the Shares and Warrants underlying the Units so purchased by such Purchaser, as determined pursuant to Section 2.2(a), and the Company and each Purchaser shall deliver the other items set forth in Sections 2.2(a) and 2.2(b) deliverable at the Primary Closing. Upon delivery, the Shares and Warrants will be separately transferable. Upon satisfaction of the covenants and conditions set forth in Sections 2.2(a), 2.2(b) and 2.3, the Primary Closing shall occur at 11:00 a.m., New York City time, on the Primary Closing Date, at the offices of EGS or such other location as the parties shall mutually agree.

(b) On the Secondary Closing Date, Merck Global Health Innovation Fund, LLC shall cause the Escrow Agent to release to the Company the funds representing the purchase price of the Remaining Merck Securities. The Company shall deliver to Merck Global Health Innovation Fund, LLC the Shares and Warrants underlying the Remaining Merck Securities and the Company and Merck Global Health Innovation Fund, LLC shall deliver the other items set forth in Sections 2.2(c) and 2.2(d) deliverable at the Secondary Closing. Upon satisfaction of the covenants and conditions set forth in Sections 2.2(c), 2.2(d) and 2.3, the Secondary Closing shall occur at 11:00 a.m., New York City time, on the Secondary Closing Date, at the offices of EGS or such other location as the parties shall mutually agree.

2.2 Deliveries.

- (a) On or prior to the Primary Closing Date, the Company shall deliver or cause to be delivered to each Purchaser and the Advisors the following:
- (i) this Agreement duly executed by the Company;
 - (ii) the Escrow Agreement duly executed by the Company and the Escrow Agent;
 - (iii) executed written consents from shareholders of the Company holding more than 50% of the outstanding voting power of the Company, and constituting their approval of the matters required to be addressed in the Shareholder Approval;
 - (iv) a legal opinion of Company Counsel, substantially in the form of Exhibit C-1 attached hereto;
 - (v) one or more stock certificates (or copies thereof provided by the Transfer Agent), free and clear of all restrictive and other legends (except as expressly provided in Section 4.1(b) hereof), evidencing such number of Shares that underlie the number of Units set forth on the signature page hereto executed by such Purchaser, registered in the name of such Purchaser (or its designee), except the number of Shares so delivered to Merck Global Health Innovation Fund, LLC on the Primary Closing Date shall be 1,500,000 Shares;
 - (vi) a copy of the irrevocable instructions to the Transfer Agent substantially in the form of Exhibit E instructing the Transfer Agent to deliver, on an expedited basis, one or more stock certificates evidencing such number of Shares as are being delivered on the Primary Closing Date, as described in Clause (iii) immediately above, registered in the names of such Purchasers;
 - (vii) a Warrant, free and clear of all restrictive and other legends (except as expressly provided in Section 4.1(b) hereof), registered in the name of such Purchaser to purchase up to the number of Warrant Shares that underlie the number of Units purchased on the Primary Closing Date by such Purchaser, which shall equal 0.75 of a share of Common Stock per Warrant, with an exercise price equal to \$1.3125, which shall be a price that is at a 25% premium to the Closing Bid Price on the Execution Date, subject to adjustment therein (such Warrant certificate may be delivered within three Trading Days of the Primary Closing Date);
 - (viii) approval by each applicable Trading Market of an additional listing application covering all of the Securities to be delivered on such Closing Date; and
 - (ix) the Lock-Up Agreements.
- (b) On or prior to the Primary Closing Date, each Purchaser, as applicable, shall deliver or cause to be delivered to the Company the following:
- (i) this Agreement duly executed by such Purchaser;

(ii) for Merck Global Health Innovation Fund, LLC, the Escrow Agreement duly executed by Merck Global Health Innovation Fund, LLC;

(iii) to the Company (A) for all Purchasers excluding Merck Global Health Innovation Fund, LLC, such Purchaser's Subscription Amount, and (B) for Merck Global Health Innovation Fund, LLC, \$1,715,625.00, in each case, by wire transfer to the account specified in writing by the Company; and

(iv) for Merck Global Health Innovation Fund, LLC, \$2,784,375.88, representing the purchase price of the Remaining Merck Securities to the Escrow Agent by wire transfer to the account specified in writing by the Escrow Agent.

(c) On or prior to the Secondary Closing Date, the Company shall have delivered or caused to be delivered all of the items whose delivery was required under Section 2.2(a), and shall deliver or cause to be delivered to Merck Global Health Innovation Fund, LLC and the Advisors the following:

(i) a legal opinion of Company Counsel, substantially in the form of Exhibit C-2 attached hereto;

(ii) one or more stock certificates (or copies thereof provided by the Transfer Agent), free and clear of all restrictive and other legends (except as expressly provided in Section 4.1(b) hereof), evidencing such 2,434,427 Shares, registered in the name of Merck Global Health Innovation Fund, LLC;

(iii) a copy of the irrevocable instructions to the Transfer Agent substantially in the form of Exhibit E instructing the Transfer Agent to deliver, on an expedited basis, one or more stock certificates evidencing such number of Shares as are being delivered on the Secondary Closing Date, as described in Clause (ii) immediately above, registered in the name of Merck Global Health Innovation Fund, LLC;

(iv) a Warrant, free and clear of all restrictive and other legends (except as expressly provided in Section 4.1(b) hereof), registered in the name of Merck Global Health Innovation Fund, LLC, to purchase up to 1,825,821 Warrant Shares, which shall equal 0.75 of a share of Common Stock per Warrant, with an exercise price equal to \$1.3125, which shall be a price that is at a 25% premium to the Closing Bid Price on the Execution Date, subject to adjustment therein (such Warrant certificate may be delivered within three Trading Days of the Secondary Closing Date);

(v) approval by each applicable Trading Market of an additional listing application covering all of the Securities to be delivered on such Closing Date.

(d) On or prior to the Secondary Closing Date, Merck Global Health Innovation Fund, LLC shall have delivered or caused to be delivered this Agreement and the Escrow Agreement duly executed by it, and shall have caused the Escrow Agent to release to the Company \$2,784,375.88, representing the purchase price of the Remaining Merck Securities by wire transfer to the account specified in writing by the Company.

2.3 Closing Conditions.

(a) The obligations of the Company hereunder in connection with each Closing Date are subject to the satisfaction or waiver by the Company, at or before the applicable Closing Date, of each of the following conditions:

(i) the accuracy in all material respects (or, to the extent representations or warranties are qualified by materiality or Material Adverse Effect, in all respects) on the applicable Closing Date of the representations and warranties of the applicable Purchasers contained herein (unless as of a specific date therein in which case they shall be accurate as of such date);

(ii) all obligations, covenants and agreements of each applicable Purchaser required to be performed at or prior to the applicable Closing Date shall have been performed; and

(iii) the delivery by each applicable Purchaser of the items set forth in Section 2.2(b) of this Agreement for the Primary Closing and items set forth in Section 2.2(d) of this Agreement for the Secondary Closing.

(b) The respective obligations of each Purchaser hereunder in connection with the Closing are subject to the satisfaction or waiver by such Purchaser, at or before the applicable Closing, of each of the following conditions:

(i) the accuracy in all material respects (or, to the extent representations or warranties are qualified by materiality or Material Adverse Effect, in all respects) when made and on the applicable Closing Date of the representations and warranties of the Company contained herein (unless made as of a different, and specific, date set forth therein, in which case they shall be accurate as of such date);

(ii) all obligations, covenants and agreements of the Company required to be performed at or prior to the applicable Closing Date shall have been performed;

(iii) the delivery by the Company of the items set forth in Section 2.2(a) of this Agreement for the Primary Closing and items set forth in Section 2.2(c) of this Agreement for the Secondary Closing;

(iv) there shall have been no Material Adverse Effect with respect to the Company since the date hereof; and

(v) from the date hereof to the applicable Closing Date, trading in the Common Stock shall not have been suspended by the Commission or the Company's principal Trading Market, and, at any time prior to the applicable Closing Date, trading in securities generally as reported by Bloomberg L.P. shall not have been suspended or limited, or minimum prices shall not have been established on securities whose trades are reported by such service, or on any Trading Market, nor shall a banking moratorium have been declared either by the United States or New York State authorities nor shall there have occurred any material outbreak or escalation of hostilities or other national or international calamity of such magnitude in its effect on, or any material adverse change

in, any financial market which, in each case, in the reasonable judgment of such Purchaser, makes it impracticable or inadvisable to purchase the Securities at the applicable Closing.

(c) The obligations of Merck Global Health Innovation Fund, LLC hereunder in connection with the Secondary Closing are subject to the satisfaction or waiver by such Purchaser, at or before such Closing, of the conditions set forth in Section 2.3(b), as applicable, and the following additional condition:

(i) the Company shall have secured each required Shareholder Approval and the satisfaction of the 20 calendar day waiting period required by Rule 14c-2(b) under the Exchange Act.

ARTICLE III. REPRESENTATIONS AND WARRANTIES

3.1 **Representations and Warranties of the Company.** Except as set forth in the Disclosure Schedules attached hereto (each a “Disclosure Schedule”), which Disclosure Schedules shall be deemed a part hereof and shall qualify any representation or warranty otherwise made herein to the extent of the disclosure contained in the corresponding section of the Disclosure Schedules, the Company hereby makes the following representations and warranties to each Purchaser and the Advisors:

(a) **Subsidiaries.** All of the direct and indirect subsidiaries of the Company are set forth on Schedule 3.1(a). Except as described in the SEC Reports and as set forth on Schedule 3.1(a), the Company owns, directly or indirectly, all of the capital stock or other equity interests of each Subsidiary free and clear of any Liens, all of the issued and outstanding shares of capital stock or comparable equity interests of each Subsidiary are validly issued and are fully paid, non-assessable and free of preemptive and similar rights to subscribe for or purchase securities and the Company or one of its Subsidiaries has the unrestricted right to vote and (subject to limitations imposed by applicable law) to receive dividends and distributions on all capital securities of its Subsidiaries as owned by the Company or such Subsidiary.

(b) **Organization and Qualification.** The Company and each of the Subsidiaries is an entity duly incorporated or otherwise organized, validly existing and, for the Company and its U.S. Subsidiaries, in good standing under the laws of the jurisdiction of its incorporation or organization, with the requisite power and authority to own and use its properties and assets and to carry on its business as currently conducted. Neither the Company nor any Subsidiary is in violation nor default of any of the provisions of its respective certificate or articles of incorporation, bylaws or other organizational or charter documents. Each of the Company and the Subsidiaries is duly qualified to conduct business and is in good standing as a foreign corporation or other entity in each jurisdiction in which the nature of the business conducted or property owned by it makes such qualification necessary, except where the failure to be so qualified or in good standing, as the case may be, could not have or reasonably be expected to result in, individually or in the aggregate: (i) a material adverse effect on the legality, validity or enforceability of any Transaction Document, (ii) a material adverse effect on the results of operations, assets, business, prospects or condition (financial or otherwise) of the Company and the Subsidiaries, taken as a whole, or (iii) a material adverse effect on the Company’s ability to perform in any material respect on a timely basis its obligations under any Transaction Document (any of (i), (ii) or (iii), a “Material Adverse Effect”) and no Proceeding has been instituted in any such jurisdiction revoking, limiting or curtailing or seeking to revoke, limit or curtail such power and authority or qualification.

(c) Authorization; Enforcement. The Company has the requisite corporate power and authority to enter into and to consummate the transactions contemplated by this Agreement and each of the other Transaction Documents and otherwise to carry out its obligations hereunder and thereunder. The execution and delivery of each of this Agreement and the other Transaction Documents by the Company and the consummation by it of the transactions contemplated hereby and thereby have been duly authorized by all necessary action on the part of the Company and no further consent or action is required by the Company, the Board of Directors or the Company's stockholders in connection herewith or therewith, other than in connection with the Required Approvals. This Agreement and each other Transaction Document to which the Company is a party has been (or upon delivery will have been) duly executed by the Company and, when delivered in accordance with the terms hereof and thereof, will constitute the valid and binding obligation of the Company enforceable against the Company in accordance with its terms, except: (i) as limited by general equitable principles and applicable bankruptcy, insolvency, reorganization, moratorium and other laws of general application affecting enforcement of creditors' rights generally, (ii) as limited by laws relating to the availability of specific performance, injunctive relief or other equitable remedies and (iii) insofar as indemnification and contribution provisions may be limited by applicable law.

(d) No Conflicts. The execution, delivery and performance by the Company of this Agreement and the other Transaction Documents to which it is a party, the issuance and sale of the Securities and the consummation by it of the transactions contemplated hereby and thereby do not and will not: (i) conflict with or violate any provision of the Company's or any Subsidiary's certificate or articles of incorporation, bylaws or other organizational or charter documents, (ii) conflict with, or constitute a default (or an event that with notice or lapse of time or both would become a default) under, result in the creation of any Lien upon any of the properties or assets of the Company or any Subsidiary, or give to others any rights of termination, amendment, acceleration or cancellation (with or without notice, lapse of time or both) of, any agreement, credit facility, debt or other instrument (evidencing a Company or Subsidiary debt or otherwise) or other understanding to which the Company or any Subsidiary is a party or by which any property or asset of the Company or any Subsidiary is bound or affected, or (iii) subject to the Required Approvals, conflict with or result in a violation of any law (including without limitation the CLIA), rule, regulation, order, judgment, injunction, decree or other restriction of any court or governmental authority (including without limitation the FDA) to which the Company or a Subsidiary is subject (including without limitation federal and state securities laws and regulations and the rules and regulations of any self-regulatory organization to which the Company or its securities are subject, including all applicable Trading Markets), or by which any property or asset of the Company or a Subsidiary is bound or affected; except in the case of each of clauses (ii) and (iii), such as could not have or reasonably be expected to result in a Material Adverse Effect.

(e) Filings, Consents and Approvals. The Company has received all consents, waivers, authorizations or orders of, has given any notices to, or made all filings or registrations with, any court or other federal, state, local or other governmental authority, agency or other Person (collectively, "Consents"), to own, lease and operate its properties and conduct its business as it is now being conducted, and each such Consent is valid and in full force and effect. Neither the Company nor any of its Affiliates has received any notice of any investigation or proceedings which, if decided adversely to the Company, could reasonably be expected to result in the revocation of, or the imposition of a materially burdensome restriction on, any Consent. No Consent contains a materially burdensome restriction not disclosed in the SEC Reports.

The Company is not required to obtain any Consents in connection with the execution, delivery and performance by the Company of the Transaction Documents, other than: (i) the filings required pursuant to Section 4.4 of this Agreement, (ii) the filings with the Commission pursuant to Article V of this Agreement, (iii) the notice and/or application(s) to each applicable Trading Market for the issuance and sale of the Securities and the listing of the Shares and Warrant Shares for trading thereon in the time and manner required thereby, (iv) the filing of Form D with the Commission and such filings as are required to be made under applicable state securities laws, (v) the waivers of registration rights described in Section 3.1(w) (collectively, the “Required Approvals”) and (vi) Shareholder Approval.

(f) Issuance of the Securities. The Shares and Warrants are duly authorized and, when issued and paid for in accordance with the applicable Transaction Documents, will be duly and validly issued, fully paid and nonassessable, free and clear of all Liens imposed by the Company, other than restrictions on transfer provided for in the Transaction Documents. The Warrant Shares, when issued in accordance with the terms of the Transaction Documents, will be validly issued, fully paid and nonassessable, free and clear of all Liens imposed by the Company, other than restrictions on transfer provided for in the Transaction Documents. The Company has reserved from its duly authorized capital stock the maximum number of shares of Common Stock issuable pursuant to this Agreement and the Warrants.

(g) Capitalization. As of May 12, 2016 and the date hereof, the capitalization of the Company is as set forth on Schedule 3.1(g)(1), which Schedule 3.1(g)(1) shall also include the number of shares of Common Stock owned beneficially, and of record, by Affiliates of the Company as of the date hereof. Except as disclosed in Schedule 3.1(g), the Company has not issued any capital stock since its most recently filed periodic report under the Exchange Act, other than pursuant to the exercise of employee stock options under the Company’s stock incentive plans outstanding as of the date of the most recently filed periodic report under the Exchange Act. Except as disclosed in Schedule 3.1(g), no Person has any right of first refusal, preemptive right, right of participation, or any similar right to participate in the transactions contemplated by the Transaction Documents. Except as a result of the purchase and sale of the Securities and as set forth in Schedules 3.1(g)(1) and (2), there are no outstanding options, warrants, scrip rights to subscribe to, calls or commitments of any character whatsoever relating to, or securities, rights or obligations convertible into or exercisable or exchangeable for, or giving any Person any right to subscribe for or acquire any shares of Common Stock or the capital stock of any Subsidiary, or contracts, commitments, understandings or arrangements by which the Company or any Subsidiary is or may become bound to issue additional shares of Common Stock or Common Stock Equivalents or capital stock of any Subsidiary. The issuance and sale of the Securities will not obligate the Company or any Subsidiary to issue shares of Common Stock or other securities to any Person (other than the Purchasers) and will not result in a right of any holder of Company securities to adjust the exercise, conversion, exchange or reset price under any of such securities. There are no outstanding securities or instruments of the Company or any Subsidiary that contain any redemption or similar provisions, and there are no contracts, commitments, understandings or arrangements by which the Company or any Subsidiary is or may become bound to redeem a security of the Company or such Subsidiary. The Company does not have any stock appreciation rights or “phantom stock” plans or any similar plan or agreement. All of the outstanding shares of capital stock of the Company are duly authorized, validly issued, fully paid and nonassessable, have been issued in compliance with all federal and state securities laws, and none of such outstanding shares was issued in violation of any preemptive rights or similar rights to subscribe for or purchase securities. Other than the Required Approvals, no further approval or authorization of any stockholder, the Board of Directors or others is required for the issuance and sale of the Securities. Except as disclosed in Schedule 3.1(g), there are no stockholders agreements, voting agreements or other similar agreements with respect to the Company’s capital stock to which the Company is a party or, to the knowledge of the Company, between or among any of the Company’s stockholders. To the knowledge of the Company, except as disclosed in Schedules 3.1(g)(1) and (2) hereto, no Person or group of related Persons beneficially owns (as determined pursuant to Rule 13d-3 under the Exchange Act), or has the right to acquire, by agreement with or by obligation binding upon the Company, beneficial ownership in excess of 5% of the outstanding Common Stock.

The pro forma information of the Company set forth in Schedule 3.1(g)(2) presents fairly the information purported to be shown therein, the assumptions used in the preparation thereof are reasonable and the adjustments used therein are appropriate to give effect to the transactions and circumstances purported to be reflected therein.

(h) SEC Reports; Financial Statements. The Company has filed all reports, schedules, forms, statements and other documents required to be filed by the Company under the Securities Act and the Exchange Act, including pursuant to Section 13(a), 14(a) or 15(d) thereof, for the two years preceding the date hereof (or such shorter period as the Company was required by law or regulation to file such material) (the foregoing materials, including the exhibits thereto and documents incorporated by reference therein, being collectively referred to herein as the "SEC Reports") on a timely basis or has received a valid extension of such time of filing and has filed any such SEC Reports prior to the expiration of any such extension. As of their respective dates, the SEC Reports complied in all material respects with the requirements of the Securities Act and the Exchange Act, as applicable, and none of the SEC Reports, when filed, contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading. The Company has never been an issuer subject to Rule 144(i) under the Securities Act. The financial statements of the Company included in the SEC Reports comply in all material respects with applicable accounting requirements and the rules and regulations of the Commission with respect thereto as in effect at the time of filing. Such financial statements have been prepared in accordance with United States generally accepted accounting principles applied on a consistent basis during the periods involved ("GAAP"), except as may be otherwise specified in such financial statements or the notes thereto and except that unaudited financial statements may not contain all footnotes required by GAAP, and fairly present in all material respects the financial position of the Company and its consolidated Subsidiaries as of and for the dates thereof and the results of operations and cash flows for the periods then ended, subject, in the case of unaudited statements, to normal, immaterial, year-end audit adjustments. All material agreements to which the Company or any Subsidiary is a party or to which the property or assets of the Company or any Subsidiary are subject are included as part of or identified in the SEC Reports, to the extent such agreements are required to be included or identified pursuant to the rules and regulations of the Commission.

(i) Material Changes; Undisclosed Events, Liabilities or Developments. Since the date of the latest audited financial statements included within the SEC Reports, except as specifically disclosed in a subsequent SEC Report filed prior to the date hereof: (i) there has been no event, occurrence or development that has had or that could reasonably be expected to result, individually or in the aggregate, in a Material Adverse Effect, (ii) the Company has not incurred any liabilities (contingent or otherwise) other than (A) trade payables and accrued expenses incurred in the ordinary course of business consistent with past practice and (B) liabilities not required to be reflected in the Company's financial statements pursuant to GAAP or disclosed in filings made with the Commission, (iii) the Company has not altered its method of accounting or changed its auditors, except as disclosed in its SEC Reports, (iv) the Company has not declared or made any dividend or distribution of cash or other property to its stockholders or purchased, redeemed or made any agreements to purchase or redeem any shares of its capital stock and (v) the Company has not issued any equity securities to any officer, director or Affiliate, except pursuant to existing Company stock incentive plans. The Company does not have pending before the Commission any request for confidential treatment of information. Except for the issuance of the Securities contemplated by this Agreement or as set forth on Schedule 3.1(i), no event, liability, fact, circumstance, occurrence or development has occurred or exists, or is reasonably expected to occur or exist, with respect to the Company or its Subsidiaries or their respective businesses, properties, operations, assets or financial condition, that would be required to be disclosed by the Company under applicable securities laws at the time this representation is made or deemed made that has not been publicly disclosed at least one (1) Trading Day prior to the date that this representation is made.

(j) Litigation. There is no action, suit, inquiry, notice of violation, proceeding or investigation pending or, to the knowledge of the Company, threatened against or affecting the Company, any Subsidiary or any of their respective properties before or by any court, public board, arbitrator, governmental or administrative agency or regulatory authority or body (federal, state, county, local or foreign) (collectively, an “Action”) which (i) adversely affects or challenges the legality, validity or enforceability of any of the Transaction Documents or the Securities or (ii) could, if there were an unfavorable decision, have or reasonably be expected to result in, individually or in the aggregate, a Material Adverse Effect. Neither the Company nor any Subsidiary, nor any director or officer thereof, is or has been the subject of any Action involving a claim of violation of or liability under federal or state securities laws or a claim of breach of fiduciary duty. There has not been, and to the knowledge of the Company, there is not pending or contemplated, any investigation by the Commission involving the Company or any current or former director or officer of the Company. The Commission has not issued any stop order or other order suspending the effectiveness of any registration statement filed by the Company under the Exchange Act or the Securities Act.

(k) Labor Relations. No labor dispute exists or, to the knowledge of the Company, is imminent with respect to any of the employees of the Company, which could reasonably be expected to result in a Material Adverse Effect. None of the Company’s or its Subsidiaries’ employees is a member of a union that relates to such employee’s relationship with the Company or such Subsidiary, and neither the Company nor any of its Subsidiaries is a party to a collective bargaining agreement, and the Company and its Subsidiaries believe that their relationships with their employees are good. To the knowledge of the Company, no executive officer of the Company or any Subsidiary is, or is now expected to be, in violation of any material term of any employment contract, confidentiality, disclosure or proprietary information agreement or non-competition agreement, or any other contract or agreement or any restrictive covenant in favor of any third party, and the continued employment of each such executive officer does not subject the Company or any of its Subsidiaries to any liability with respect to any of the foregoing matters. Except as disclosed in the SEC Reports, during the period covered by the SEC Reports, no executive officer of the Company or any of its Subsidiaries (as defined in Rule 501(f) of the Securities Act) has notified the Company or any such Subsidiary that such officer intends to leave the Company or any such Subsidiary or otherwise terminate such officer’s employment with the Company or any such Subsidiary. The Company and its Subsidiaries are in compliance with all U.S. federal, state, local and foreign laws and regulations relating to employment and employment practices, terms and conditions of employment and wages and hours, except where the failure to be in compliance could not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect.

(l) Compliance. Neither the Company nor any Subsidiary: (i) is in default under or in violation of (and no event has occurred that has not been waived that, with notice or lapse of time or both, would result in a default by the Company or any Subsidiary under), nor has the Company or any Subsidiary received notice of a claim that it is in default under or that it is in violation of, any indenture, loan or credit agreement or any other agreement or instrument to which it is a party or by which it or any of its properties is bound (whether or not such default or violation has been waived), (ii) is in violation of any judgment, decree, or order of any court, arbitrator or other governmental authority or (iii) is or has been in violation of any statute (including without limitation the CLIA), rule, ordinance or regulation of any governmental authority (including without limitation the FDA), including without limitation all foreign, federal, state and local laws relating to taxes, health, occupational health and safety, product quality and safety and employment and labor matters, except in each case as could not have or reasonably be expected to result in, individually or in the aggregate, a Material Adverse Effect.

(m) Environmental Laws. The Company and its Subsidiaries (i) are in compliance with all federal, state, local and foreign laws relating to pollution or protection of human health or the environment (including ambient air, surface water, groundwater, land surface or subsurface strata), including, without limitation, laws relating to emissions, discharges, releases or threatened releases of chemicals, pollutants, contaminants, or toxic or hazardous substances or wastes (collectively, "Hazardous Materials") into the environment, or otherwise relating to the manufacture, processing, distribution, use, treatment, storage, disposal, transport or handling of Hazardous Materials, as well as all authorizations, codes, decrees, demands, or demand letters, injunctions, judgments, licenses, notices or notice letters, orders, permits, plans or regulations, issued, entered, promulgated or approved thereunder ("Environmental Laws"); (ii) have received all permits, licenses or other approvals required of them under applicable Environmental Laws to conduct their respective businesses; and (iii) are in compliance with all terms and conditions of any such permit, license or approval where in each clause (i), (ii) and (iii), the failure to so comply could be reasonably expected to have, individually or in the aggregate, a Material Adverse Effect.

(n) Regulatory Permits. The Company and the Subsidiaries possess all certificates, authorizations and permits issued by the appropriate federal, state, local or foreign regulatory authorities necessary to conduct their respective businesses as presently conducted and as described in the SEC Reports, except where the failure to possess such permits could not reasonably be expected to result in a Material Adverse Effect ("Material Permits"), and neither the Company nor any Subsidiary has received any notice of proceedings relating to the revocation or modification of any Material Permit.

(o) Title to Assets. The Company and the Subsidiaries have good and marketable title in fee simple to all real property owned by them and good and marketable title in all personal property owned by them that is material to the business of the Company and the Subsidiaries, in each case free and clear of all Liens, except for (i) Liens as do not materially affect the value of such property and do not materially interfere with the use made and proposed to be made of such property by the Company and the Subsidiaries, (ii) Liens for the payment of federal, state or other taxes, for which appropriate reserves have been made therefor in accordance with GAAP and the payment of which is neither delinquent nor subject to penalties, or (iii) or as disclosed in the SEC Reports. Any real property and facilities held under lease by the Company and the Subsidiaries are held by them under valid, subsisting and enforceable leases with which the Company and the Subsidiaries are in compliance.

(p) Intellectual Property. The Company and the Subsidiaries own, have, or have rights or license to use, all patents, patent rights, patent applications, trademarks, trademark applications, service marks, service mark regulations, trade names, trade secrets, inventions, copyrights, licenses, inventions, approvals and other intellectual property rights and similar rights as described in Schedule 3.1(p) as necessary or required for use in connection with their respective businesses and which the failure to so have could have a Material Adverse Effect (collectively, the “Intellectual Property Rights”). None of, and neither the Company nor any Subsidiary has received a notice (written or otherwise) that any of, the Intellectual Property Rights has expired, terminated or been abandoned, or is expected to expire or terminate or be abandoned, within two (2) years from the date of this Agreement. Neither the Company nor any Subsidiary has received, since the date of the latest audited financial statements included within the SEC Reports, a written notice of a claim or otherwise has any knowledge that the Intellectual Property Rights violate or infringe upon the rights of any Person, except as could not have or reasonably be expected to not have a Material Adverse Effect. To the knowledge of the Company, all such Intellectual Property Rights are enforceable and there is no existing infringement by another Person of any of the Intellectual Property Rights. Except as disclosed in the Schedule 3.1(p), there is no claim, action or proceeding being made or brought, or to the knowledge of the Company, being threatened, against the Company or its Subsidiaries regarding its Intellectual Property Rights. The Company has not received any claim for royalties or other compensation from individuals, including employees or former employees of the Company who have made or are alleged to have made inventive contributions to the Company’s technology or products, that are pending or unsettled and, except as set forth in Schedule 3.1(p), the Company has no obligation to pay royalties or other compensation to any such individuals. The Company and its Subsidiaries have taken reasonable security measures to protect the secrecy, confidentiality and value of all of their intellectual properties, except where failure to do so could not, individually or in the aggregate, reasonably be expected to have a Material Adverse Effect.

(q) Insurance. The Company and the Subsidiaries are insured by insurers of recognized financial responsibility against such losses and risks and in such amounts as are prudent and customary in the businesses in which the Company and the Subsidiaries are engaged, including, but not limited to, directors and officers insurance coverage at least equal to the aggregate Subscription Amount. Neither the Company nor any Subsidiary has any reason to believe that it will not be able to renew its existing insurance coverage as and when such coverage expires or to obtain similar coverage from similar insurers as may be necessary to continue its business without a significant increase in cost.

(r) Transactions with Affiliates and Employees. Except as set forth in the SEC Reports, none of the officers or directors of the Company or any Subsidiary and, to the knowledge of the Company, none of the employees of the Company or any Subsidiary is presently a party to any transaction with the Company or any Subsidiary (other than for services as employees, officers and directors), including any contract, agreement or other arrangement providing for the furnishing of services to or by, providing for rental of real or personal property to or from, providing for the borrowing of money from or lending of money to or otherwise requiring payments to or from any officer, director or such employee or, to the knowledge of the Company, any corporation, partnership, trust or other entity in which any officer, director, or any such employee has a substantial interest or is an officer, director, trustee, stockholder, member or partner, in each case in excess of the lesser of \$120,000 or one percent of the average of the Company’s total assets at year end for the last two completed fiscal years other than for: (i) payment of salary or consulting fees for services rendered, (ii) reimbursement for expenses incurred on behalf of the Company and (iii) other employee benefits, including stock option agreements under any stock incentive plan of the Company. As of the date hereof, each of Timothy J.R. Harris, Ph.D., D.Sc., Kevin Krenitsky, M.D., Timothy C. Dec, Robert McG. Lilley, Vadim Sapiro and Albert J. Risdorfer is an employee or affiliate of the Company as those terms are used in FINRA Rule 5123.

(s) Sarbanes-Oxley; Internal Accounting Controls. The Company and the Subsidiaries are in compliance with any and all applicable requirements of the Sarbanes-Oxley Act of 2002 that are effective as of the date hereof, and any and all applicable rules and regulations promulgated by the Commission thereunder that are effective as of the date hereof and as of the applicable Closing Date. The Company and the Subsidiaries maintain a system of internal accounting controls sufficient to provide reasonable assurance that: (i) transactions are executed in accordance with management's general or specific authorizations, (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with GAAP and to maintain asset accountability, (iii) access to assets is permitted only in accordance with management's general or specific authorization, and (iv) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences. During the twelve months prior to the date hereof, neither the Company nor any of its Subsidiaries have received any notice or correspondence from any accountant relating to any potential material weakness in any part of the system of internal accounting controls of the Company or any of its Subsidiaries.

The Company and the Subsidiaries have established disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) for the Company and the Subsidiaries and designed such disclosure controls and procedures to ensure that information required to be disclosed by the Company in the reports it files or submits under the Exchange Act complies with the requirements of the Exchange Act, is recorded, processed, summarized and reported to the Company's management, including the Company's principal executive officer and principal financial officer by others within those entities and is filed or submitted within the time periods specified in the Commission's rules and forms. The Company's certifying officers have evaluated the effectiveness of the disclosure controls and procedures of the Company and the Subsidiaries as of the end of the period covered by the most recently filed periodic report under the Exchange Act (such date, the "Evaluation Date"). The Company presented in its most recently filed periodic report under the Exchange Act the conclusions of the certifying officers about the effectiveness of the disclosure controls and procedures based on their evaluations as of the Evaluation Date. Such disclosure controls and procedures are effective. Since the Evaluation Date, there have been no changes in the internal control over financial reporting (as such term is defined in the Exchange Act) of the Company and its Subsidiaries that have materially affected, or is reasonably likely to materially affect, the internal control over financial reporting of the Company or its Subsidiaries.

(t) Certain Fees. The Company shall be responsible for the payment of any Advisors' fees, escrow related fees and expenses, financial advisory fees, or brokers' commission (other than for persons engaged by any Purchaser or its investment advisor) relating to or arising out of the issuance of the Securities pursuant to this Agreement. The Purchasers shall have no obligation with respect to any fees or with respect to any claims made by or on behalf of other Persons for fees of a type contemplated in this Section that may be due in connection with the transactions contemplated by the Transaction Documents. The Company shall pay, and hold each Purchaser harmless against, any liability, loss or expense (including, without limitation, reasonable attorney's fees and out-of-pocket expenses) arising in connection with any such claim for fees arising out of the issuance of the Securities pursuant to this Agreement. The Company acknowledges that it has engaged Cowen and Company, LLC and Maxim Group LLC as its placement agents and Leerink Partners LLC as its financial advisor (the placement agents and the financial advisor, collectively, the "Advisors") in connection with the sale of the Securities. Other than the Advisors, the Company has not engaged any other placement or similar agent or financial or similar advisor in connection with the sale of the Securities.

(u) Private Placement. Assuming the accuracy of the Purchasers' representations and warranties set forth in Section 3.2, no registration under the Securities Act is required for the offer and sale of the Securities by the Company to the Purchasers as contemplated hereby. The issuance and sale of the Securities hereunder does not contravene the rules and regulations of the Trading Market.

(v) Investment Company. The Company is not, and immediately after receipt of payment for the Securities, will not be, required to register as an "investment company" under the Investment Company Act of 1940, as amended. The Company shall conduct its business in a manner so that it will not be required to register as an "investment company" under the Investment Company Act of 1940.

(w) Registration Rights. Other than each of the Purchasers and as described in Schedule 3.1(w), no Person has any right to cause the Company to effect the registration under the Securities Act or any other governmental authority of any securities of the Company or any Subsidiary.

(x) Listing and Maintenance Requirements. The Common Stock is registered pursuant to Section 12(b) or 12(g) of the Exchange Act, and the Company has taken no action designed to, or which to its knowledge is likely to have the effect of, terminating the registration of the Common Stock under the Exchange Act nor has the Company received any notification that the Commission is contemplating terminating such registration. The Company has not, in the 12 months preceding the date hereof, received notice from any Trading Market on which the Common Stock is or has been listed or quoted to the effect that the Company is not in compliance with the listing or maintenance requirements of such Trading Market. The Company is, and has no reason to believe that it will not in the foreseeable future continue to be, in compliance with all such listing and maintenance requirements. The Common Stock is currently eligible for electronic transfer through the Depository Trust Company or another established clearing corporation and the Company is current in payment of the fees to the Depository Trust Company (or such other established clearing corporation) in connection with such electronic transfer.

(y) Application of Takeover Protections. The Company and the Board of Directors have taken all necessary action, if any, in order to render inapplicable any control share acquisition, business combination, poison pill (including any distribution under a rights agreement) or other similar anti-takeover provision under the Company's certificate of incorporation (or similar charter documents) or the laws of its state of incorporation that is or could become applicable to the Purchasers as a result of the Purchasers and the Company fulfilling their obligations or exercising their rights under the Transaction Documents, including without limitation as a result of the Company's issuance of the Securities and the Purchasers' ownership of the Securities.

(z) Disclosure. Except with respect to the material terms and conditions of the transactions contemplated by the Transaction Documents and any information provided to an Excluded Purchaser pursuant to a specific due diligence request by such Excluded Purchaser to receive material nonpublic information, the Company confirms that neither it nor any other Person acting on its behalf has provided any of the Purchasers (other than Excluded Purchasers) or their agents or counsel with any information that constitutes or might constitute material, non public information. The Company understands and confirms that the Purchasers will rely on the foregoing representation in effecting transactions in securities of the Company (other than Excluded Purchasers). No representation or warranty of the Company contained in this Agreement, as qualified by the Disclosure Schedules, contains any untrue statement of a material fact or omits to state a material fact necessary in order to make the statements contained herein or therein not misleading in light of the circumstances under which they were made. All of the disclosure furnished by or on behalf of the Company to the Purchasers regarding the Company and its Subsidiaries, their respective businesses and the transactions contemplated hereby, including without limitation the Disclosure Schedules to this Agreement and the Marketing Materials, is true and correct and does not contain any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements made therein, in light of the circumstances under which they were made, not misleading. To the Company's knowledge, except for the transactions contemplated by this Agreement, no event or circumstance has occurred or information exists with respect to the Company or any of its Subsidiaries or its or their business, properties, operations or financial condition, which, under applicable law, rule or regulation, requires public disclosure or announcement by the Company but which has not been so publicly announced or disclosed. The Company acknowledges and agrees that no Purchaser (other than Excluded Purchasers) makes or has made any representations or warranties with respect to the transactions contemplated hereby other than those specifically set forth in Section 3.2 hereof.

(aa) No Integrated Offering. Assuming the accuracy of the Purchasers' representations and warranties set forth in Section 3.2, neither the Company, nor any of its Affiliates, nor any Person acting on its or their behalf has, directly or indirectly, made any offers or sales of any security or solicited any offers to buy any security, under circumstances that would cause this offering of the Securities to be integrated with prior offerings by the Company for purposes of (i) any applicable law or regulation, including the Securities Act, which would require the registration of any such securities under the Securities Act or any applicable law or regulations, or (ii) any applicable shareholder approval provisions of any Trading Market on which any of the securities of the Company are listed or designated.

(bb) Solvency and Indebtedness. Based on the consolidated financial condition of the Company as of the applicable Closing Date, after giving effect to the receipt by the Company of the proceeds from the sale of the Securities hereunder: (i) the present fair saleable value of the Company's assets exceeds the amount that will be required to be paid on or in respect of the Company's Indebtedness (as defined below), (ii) the Company's assets do not constitute unreasonably small capital to carry on its business as now conducted and as proposed to be conducted including its capital needs taking into account the particular capital requirements of the business conducted by the Company, consolidated and projected capital requirements and capital availability thereof, and (iii) the current cash flow of the Company, together with the proceeds the Company would receive, were it to liquidate all of its assets, after taking into account all anticipated uses of the cash, would be sufficient to pay all amounts on or in respect of its liabilities when such amounts are required to be paid. The Company does not intend to incur debts beyond its ability to pay such debts as they mature (taking into account the timing and amounts of cash to be payable on or in respect of its debt). The Company has no knowledge of any facts or circumstances which lead it to believe that it will file for reorganization or liquidation under the bankruptcy or reorganization laws of any jurisdiction within one year from the applicable Closing Date. Schedule 3.1(bb) sets forth as of the date hereof all outstanding secured and unsecured Indebtedness of the Company or any Subsidiary, or for which the Company or any Subsidiary has commitments.

For the purposes of this Agreement, (x) “Indebtedness” means without duplication (A) all indebtedness for borrowed money, (B) all obligations issued, undertaken or assumed as the deferred purchase price of property or services (other than trade payables entered into in the ordinary course of business), (C) all reimbursement or payment obligations with respect to letters of credit, surety bonds and other similar instruments, (D) all obligations evidenced by notes, bonds, debentures or similar instruments, including obligations so evidenced incurred in connection with the acquisition of property, assets or businesses, (E) all indebtedness created or arising under any conditional sale or other title retention agreement, or incurred as financing, in either case with respect to any property or assets acquired with the proceeds of such indebtedness (even though the rights and remedies of the seller or bank under such agreement in the event of default are limited to repossession or sale of such property), (F) all monetary obligations under any leasing or similar arrangement which, in connection with generally accepted accounting principles, consistently applied for the periods covered thereby, is classified as a capital lease, (G) all indebtedness referred to in clauses (A) through (F) above secured by (or for which the holder of such Indebtedness has an existing right, contingent or otherwise, to be secured by) any mortgage, lien, pledge, charge, security interest or other encumbrance upon or in any property or assets (including accounts and contract rights) owned by any Person, even though the Person which owns such assets or property has not assumed or become liable for the payment of such indebtedness, and (H) all Contingent Obligations in respect of indebtedness or obligations of others of the kinds referred to in clauses (A) through (G) above; (y) “Contingent Obligation” means, as to any Person, any direct or indirect liability, contingent or otherwise, of that Person with respect to any indebtedness, lease, dividend or other obligation of another Person if the primary purpose or intent of the Person incurring such liability, or the primary effect thereof, is to provide assurance to the obligee of such liability that such liability will be paid or discharged, or that any agreements relating thereto will be complied with, or that the holders of such liability will be protected (in whole or in part) against loss with respect thereto. Except as disclosed in Schedule 3.1(bb), neither the Company nor any of its Subsidiaries (i) has any outstanding Indebtedness, (ii) is in violation of any term of or in default under any contract, agreement or instrument relating to any Indebtedness, except where such violations and defaults would not result, individually or in the aggregate, in a Material Adverse Effect, or (iii) is a party to any contract, agreement or instrument relating to any Indebtedness, the performance of which, in the judgment of the Company's officers, has or is expected to have a Material Adverse Effect.

(cc) No General Solicitation. Neither the Company, any of its Affiliates nor any Person acting on behalf of the Company has offered or sold any of the Securities by any form of general solicitation or general advertising. The Company has offered the Securities for sale only to the Purchasers and certain other “accredited investors” within the meaning of Rule 501 under the Securities Act.

(dd) Foreign Corrupt Practices. Neither the Company nor any Subsidiary, to the knowledge of the Company or any Subsidiary, any director, officer, agent, employee or other person acting on behalf of the Company or any Subsidiary, has, in the course of its actions for or on behalf of the Company: (i) directly or indirectly, used any funds for unlawful contributions, gifts, entertainment or other unlawful expenses related to foreign or domestic political activity, (ii) made any direct or indirect unlawful payment to foreign or domestic government officials or employees or to any foreign or domestic political parties or campaigns from corporate funds, (iii) failed to disclose fully any contribution made by the Company or any Subsidiary (or made by any person acting on its behalf of which the Company is aware) which is in violation of law, (iv) violated or is in violation any provision of FCPA, or (v) made any unlawful bribe, rebate, payoff, influence payment, kickback or other unlawful payment to any foreign or domestic government official or employee.

(ee) Accountants. The Company's accounting firm is set forth on Schedule 3.1(ee). To the knowledge and belief of the Company, such accounting firm: (i) is a registered public accounting firm as required by the Exchange Act and (ii) expressed its opinion with respect to the financial statements to be included in the Company's Annual Report on Form 10-K for the year ended December 31, 2015.

(ff) No Disagreements with Accountants and Lawyers. There are no disagreements of any kind presently existing, or reasonably anticipated by the Company to arise, between the Company and the accountants and lawyers formerly or presently employed by the Company, and the Company is current with respect to any fees owed to its accountants and lawyers which could affect the Company's ability to perform any of its obligations under any of the Transaction Documents.

(gg) Acknowledgment Regarding Purchasers' Purchase of Securities. Based upon the assumption that the transactions contemplated by this Agreement are consummated in all material respects in conformity with the Transaction Documents, the Company acknowledges and agrees that each of the Purchasers (other than Excluded Purchasers) is acting solely in the capacity of an arm's length purchaser with respect to the Transaction Documents and the transactions contemplated hereby and thereby. The Company further acknowledges that no Purchaser (other than Excluded Purchasers) is acting as a financial advisor or fiduciary of the Company (or in any similar capacity) with respect to this Agreement and the transactions contemplated hereby and any advice given by any Purchaser (other than Excluded Purchasers) or any of their respective representatives or agents in connection with the Transaction Documents and the transactions contemplated hereby and thereby is merely incidental to the Purchasers' purchase of the Securities. The Company further represents to each Purchaser that the Company's decision to enter into this Agreement has been based solely on the independent evaluation of the transactions contemplated hereby by the Company and its representatives.

(hh) Acknowledgment Regarding Purchaser's Trading Activity. Anything in this Agreement or elsewhere herein to the contrary notwithstanding (except for Sections 3.2(g) and 4.1 hereof), it is understood and acknowledged by the Company that: (i) none of the Purchasers has been asked by the Company to agree, nor has any Purchaser agreed with the Company, to desist from purchasing or selling, long and/or short, securities of the Company, or "derivative" securities based on securities issued by the Company or to hold the Securities for any specified term, (ii) past or future open market or other transactions by any Purchaser, specifically including, without limitation, Short Sales or "derivative" transactions, before or after the closing of this or future private placement transactions, may negatively affect the market price of the Company's publicly-traded securities, (iii) any Purchaser, and counter-parties in "derivative" transactions to which any such Purchaser is a party, directly or indirectly, may presently have a "short" position in the Common Stock and (iv) no Purchaser shall be deemed to have any affiliation with or control over any arm's length counter-party in any "derivative" transaction. The Company further understands and acknowledges that (y) one or more Purchasers may engage in hedging activities at various times during the period that the Securities are outstanding, including, without limitation, during the periods that the value of the Warrant Shares deliverable with respect to Securities are being determined, and (z) such hedging activities (if any) could reduce the value of the existing stockholders' equity interests in the Company at and after the time that the hedging activities are being conducted. The Company acknowledges that such aforementioned hedging activities do not constitute a breach of any of the Transaction Documents.

(ii) Regulation M Compliance. The Company has not, and to its knowledge no one acting on its behalf has, (i) taken, directly or indirectly, any action designed to cause or to result in the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of any of the Securities, (ii) other than the Advisors, sold, bid for, purchased, or paid any compensation for soliciting purchases of, any of the Securities, or (iii) other than the Advisors, paid or agreed to pay to any Person any compensation for soliciting another to purchase any other securities of the Company, other than, in the case of clauses (ii) and (iii), compensation paid to the Advisors in connection with the placement of the Securities.

(jj) FDA. As to each product subject to the jurisdiction of the FDA under the FDCA that is manufactured, packaged, labeled, tested, distributed, sold, and/or marketed by the Company or any of its Subsidiaries (each such product, a “Laboratory Developed Test”), such Laboratory Developed Test is being manufactured, packaged, labeled, tested, distributed, sold and/or marketed by the Company in compliance with all applicable requirements under FDCA and similar laws, rules and regulations relating to registration, investigational use, premarket clearance, licensure, or application approval, good manufacturing practices, good laboratory practices, good clinical practices, product listing, quotas, labeling, advertising, record keeping and filing of reports, except where the failure to be in compliance would not have a Material Adverse Effect. There is no pending, completed or, to the Company's knowledge, threatened, action (including any lawsuit, arbitration, or legal or administrative or regulatory proceeding, charge, complaint, or investigation) against the Company or any of its Subsidiaries, and none of the Company or any of its Subsidiaries has received any notice, warning letter or other communication from the FDA or any other governmental entity, which (i) contests the premarket clearance, licensure, registration, or approval of, the uses of, the distribution of, the manufacturing or packaging of, the testing of, the sale of, or the labeling and promotion of any Laboratory Developed Test, (ii) withdraws its approval of, requests the recall, suspension, or seizure of, or withdraws or orders the withdrawal of advertising or sales promotional materials relating to, any Laboratory Developed Test, (iii) imposes a clinical hold on any clinical investigation by the Company or any of its Subsidiaries, (iv) enjoins production at any facility of the Company or any of its Subsidiaries, (v) enters or proposes to enter into a consent decree of permanent injunction with the Company or any of its Subsidiaries, or (vi) otherwise alleges any violation of any laws, rules or regulations by the Company or any of its Subsidiaries, and which, either individually or in the aggregate, would have a Material Adverse Effect. The properties, business and operations of the Company have been and are being conducted in all material respects in accordance with all applicable laws, rules and regulations of the FDA. The Company has not been informed by the FDA that the FDA will prohibit the marketing, sale, license or use in the United States of any product proposed to be developed, produced or marketed by the Company nor has the FDA expressed any concern as to approving or clearing for marketing any product being developed or proposed to be developed by the Company.

(kk) Form S-3 Eligibility. As of June 1, 2016, the Company will be eligible to register the resale of the Shares and Warrant Shares for resale by the Purchasers on Form S-3 promulgated under the Securities Act; provided that the Company has filed in a timely manner all reports required to be filed during the twelve calendar months and any portion of a month immediately preceding the filing of the registration statement on Form S-3, other than a report that is required solely pursuant to Item 1.01, 1.02, 2.03, 2.04, 2.05, 2.06, 4.02(a) or 5.02(e) of Form 8-K.

(ll) Stock Incentive Plans. Each stock option granted by the Company under the Company's stock incentive plan was granted (i) in accordance with the terms of the Company's stock incentive plan and (ii) with an exercise price at least equal to the fair market value of the Common Stock on the date such stock option would be considered granted under GAAP and applicable law. No stock option granted under the Company's stock incentive plan has been backdated. The Company has not knowingly granted, and there is no and has been no Company policy or practice to knowingly grant, stock options prior to, or otherwise knowingly coordinate the grant of stock options with, the release or other public announcement of material information regarding the Company or its Subsidiaries or their financial results or prospects. Each stock option expected to be granted pursuant to proposals set forth in the Company's definitive proxy statement filed April 29, 2016 with the SEC will be granted with an exercise price at least equal to the fair market value of the Common Stock on the date such stock option would be considered granted under GAAP and applicable law.

(mm) Office of Foreign Assets Control. Neither the Company nor any Subsidiary nor, to the Company's knowledge, any director, officer, agent, employee or affiliate of the Company or any Subsidiary is currently subject to any U.S. sanctions administered by OFAC.

(nn) U.S. Real Property Holding Corporation. The Company is not and has never been a U.S. real property holding corporation within the meaning of Section 897 of the Internal Revenue Code of 1986, as amended, and the Company shall so certify upon Purchaser's request.

(oo) Tax Status. The Company and each of its Subsidiaries (i) has made or filed all foreign, federal and state income and all other tax returns, reports and declarations required by any jurisdiction to which it is subject, (ii) has paid all taxes and other governmental assessments and charges that are material in amount, shown or determined to be due on such returns, reports and declarations, except those being contested in good faith and (iii) has set aside on its books provision reasonably adequate for the payment of all taxes for periods subsequent to the periods to which such returns, reports or declarations apply. There are no unpaid taxes in any material amount claimed to be due by the taxing authority of any jurisdiction, and the officers of the Company know of no basis for any such claim.

(pp) Money Laundering. The operations of the Company and its Subsidiaries are and have been conducted at all times in compliance with applicable financial record-keeping and reporting requirements of the Currency and Foreign Transactions Reporting Act of 1970, as amended, applicable money laundering statutes and applicable rules and regulations thereunder (collectively, the "Money Laundering Laws"), and no Action or Proceeding by or before any court or governmental agency, authority or body or any arbitrator involving the Company or any Subsidiary with respect to the Money Laundering Laws is pending or, to the knowledge of the Company or any Subsidiary, threatened.

(qq) No Disqualification Events. With respect to the Securities to be offered and sold hereunder in reliance on Rule 506 of Regulation D under the Securities Act, none of the Company, any of its predecessors, any affiliated issuer, any director, executive officer, other officer of the Company participating in the offering hereunder, any beneficial owner of 20% or more of the Company's outstanding voting equity securities, calculated on the basis of voting power, nor any promoter (as that term is defined in Rule 405 under the Securities Act) connected with the Company in any capacity at the time of sale (each, an "Issuer Covered Person" and, together, "Issuer Covered Persons") is subject to any of the "Bad Actor" disqualifications described in Rule 506(d)(1)(i) to (viii) under the Securities Act (a "Disqualification Event"), except for a Disqualification Event covered by Rule 506(d)(2) or (d)(3). The Company has exercised reasonable care to determine whether any Issuer Covered Person is subject to a Disqualification Event. The Company has complied, to the extent applicable, with its disclosure obligations under Rule 506(e), and has furnished to the Purchasers a copy of any disclosures provided thereunder. Other than the Advisors, the Company is not aware of any person (other than any Issuer Covered Person) that has been or will be paid (directly or indirectly) remuneration for solicitation of purchasers in connection with the sale of any Securities. The Company will notify the Purchasers and the Advisors in writing, prior to the applicable Closing Date of (i) any Disqualification Event relating to any Issuer Covered Person and (ii) any event that would, with the passage of time, become a Disqualification Event relating to any Issuer Covered Person.

(rr) Acknowledgment of Dilution. The Company acknowledges that the issuance of the Securities may result in dilution of the outstanding shares of Common Stock, which dilution may be substantial under certain market conditions. The Company further acknowledges that its obligations under the Transaction Documents, including, without limitation, its obligation to issue the Shares and Warrant Shares pursuant to the Transaction Documents, are unconditional and absolute and not subject to any right of set off, counterclaim, delay or reduction, regardless of the effect of any such dilution or any claim the Company may have against any Purchaser and regardless of the dilutive effect that such issuance may have on the ownership of the other stockholders of the Company.

3.2 Representations and Warranties of the Purchasers. Each Purchaser, for itself and for no other Purchaser, hereby represents and warrants as of the date hereof and as of the applicable Closing Date to the Company and the Advisors as follows (unless as of a specific date therein, in which case they shall be accurate as of such date):

(a) Organization; Authority. Such Purchaser is either an individual or an entity duly incorporated or formed, validly existing and in good standing under the laws of the jurisdiction of its incorporation or formation with full right, corporate, partnership, limited liability company or similar power and authority to enter into and to consummate the transactions contemplated by the Transaction Documents and otherwise to carry out its obligations hereunder and thereunder. The execution and delivery of the Transaction Documents and performance by such Purchaser of the transactions contemplated by the Transaction Documents have been duly authorized by all necessary corporate, partnership, limited liability company or similar action, as applicable, on the part of such Purchaser. Each Transaction Document to which it is a party has been duly executed by such Purchaser, and when delivered by such Purchaser in accordance with the terms hereof, will constitute the valid and legally binding obligation of such Purchaser, enforceable against it in accordance with its terms, except: (i) as limited by general equitable principles and applicable bankruptcy, insolvency, reorganization, moratorium and other laws of general application affecting enforcement of creditors' rights generally, (ii) as limited by laws relating to the availability of specific performance, injunctive relief or other equitable remedies and (iii) insofar as indemnification and contribution provisions may be limited by applicable law.

(b) Own Account. Such Purchaser understands that the Securities are "restricted securities" and have not been registered under the Securities Act or any applicable state securities law and is acquiring the Securities as principal for its own account and not with a view to or for distributing or reselling such Securities or any part thereof in violation of the Securities Act or any applicable state securities law, has no present intention of distributing any of such Securities in violation of the Securities Act or any applicable state securities law and has no direct or indirect arrangement or understandings with any other persons to distribute or regarding the distribution of such Securities in violation of the Securities Act or any applicable state securities law (this representation and warranty not limiting such Purchaser's right to sell the Shares and Warrant Shares pursuant to the Registration Statement or otherwise in compliance with applicable federal and state securities laws). Such Purchaser is acquiring the Securities hereunder in the ordinary course of its business.

(c) Purchaser Status. At the time such Purchaser was offered the Securities, it was, and as of the date hereof it is, and on each date on which it exercises any Warrants, it will be: (i) an "accredited investor" as defined in Rule 501 under the Securities Act and (ii) either (A) an "institutional investor" as defined in FINRA Rules 5110(d)(4)(B) and Rule 5123, or (B) an employee or affiliate of the Company as those terms are used in FINRA Rule 5123. Such Purchaser is not a registered broker dealer registered under Section 15(a) of the Exchange Act, or a member of FINRA or an entity engaged in the business of being a broker dealer. Except as otherwise disclosed in writing to the Company on Exhibit B-2 (attached hereto) on or prior to the date of this Agreement, such Purchaser is not affiliated with any broker dealer registered under Section 15(a) of the Exchange Act, or a member of FINRA or an entity engaged in the business of being a broker dealer.

(d) Experience of Such Purchaser. Such Purchaser, either alone or together with its representatives, has such knowledge, sophistication and experience in business and financial matters as to be capable of evaluating the merits and risks of the prospective investment in the Securities, and has so evaluated the merits and risks of such investment. Such Purchaser is able to bear the economic risk of an investment in the Securities and, at the present time, is able to afford a complete loss of such investment.

(e) General Solicitation. Such Purchaser is not purchasing the Securities as a result of any advertisement, article, notice or other communication regarding the Securities published in any newspaper, magazine or similar media or broadcast over television or radio or presented at any seminar, disseminated over the Internet or any other general solicitation or general advertisement.

(f) Access to Information. Such Purchaser acknowledges that it has had the opportunity to review the Transaction Documents (including all exhibits and schedules thereto) and the SEC Reports and has been afforded (i) the opportunity to ask such questions as it has deemed necessary of, and to receive answers from, representatives of the Company concerning the terms and conditions of the offering of the Securities and the merits and risks of investing in the Securities; (ii) access to information about the Company, its Subsidiaries and their respective financial condition, results of operations, business, properties, management and prospects sufficient to enable it to evaluate its investment; and (iii) the opportunity to obtain such additional information that the Company possesses or can acquire without unreasonable effort or expense that is necessary to make an informed investment decision with respect to the investment. Such Purchaser acknowledges and agrees that neither the Advisors nor any of their respective Affiliates have provided such Purchaser with any information or advice with respect to the Securities nor is such information or advice necessary or desired. Neither the Advisors nor any of their respective Affiliates have made or makes any representation as to the Company or the quality of the Securities and the Advisors and any Affiliate may have acquired non-public information with respect to the Company which such Purchaser agrees need not be provided to it. In connection with the issuance of the Securities to such Purchaser, neither the Advisors nor any of their respective Affiliates have acted as financial advisor or fiduciary to such Purchaser.

(g) Certain Transactions and Confidentiality. Other than consummating the transactions contemplated hereunder, such Purchaser has not directly or indirectly, nor has any Person acting on behalf of or pursuant to any understanding with such Purchaser, executed any purchases or sales, including Short Sales, of the securities of the Company during the period commencing as of the time that such Purchaser first received a term sheet (written or oral) from the Company or any other Person representing the Company setting forth the material terms of the transactions contemplated hereunder and ending immediately prior to the execution hereof. Notwithstanding the foregoing, in the case of a Purchaser that is a multi-managed investment vehicle whereby separate portfolio managers manage separate portions of such Purchaser's assets and the portfolio managers have no direct knowledge of the investment decisions made by the portfolio managers managing other portions of such Purchaser's assets, the representation set forth above shall only apply with respect to the portion of assets managed by the portfolio manager that made the investment decision to purchase the Securities covered by this Agreement. Other than to other Persons party to this Agreement or to such Purchaser's representatives, including, without limitation, its officers, directors, partners, legal and other advisors, agents and Affiliates, such Purchaser has maintained the confidentiality of all disclosures made to it in connection with this transaction (including the existence and terms of this transaction). Notwithstanding the foregoing, for the avoidance of doubt, nothing contained herein shall constitute a representation or warranty, or preclude any actions, with respect to the identification of the availability of, or securing of, available shares to borrow in order to effect Short Sales or similar transactions in the future.

(h) No Governmental Review. Such Purchaser understands that no United States federal or state agency or any other government or governmental agency has passed on or made any recommendation or endorsement of the Securities or the fairness or suitability of the investment in the Securities nor have such authorities passed upon or endorsed the merits of the offering of the Securities.

(i) No Conflicts. The execution, delivery and performance by such Purchaser of this Agreement and the consummation by such Purchaser of the transactions contemplated hereby will not (i) result in a violation of the organizational documents of such Purchaser or (ii) conflict with, or constitute a default (or an event which with notice or lapse of time or both would become a default) under, or give to others any rights of termination, amendment, acceleration or cancellation of, any agreement, indenture or instrument to which such Purchaser is a party, or (iii) result in a violation of any law, rule, regulation, order, judgment or decree (including federal and state securities laws) applicable to such Purchaser, except in the case of clauses (ii) and (iii) above, for such that are not material and do not otherwise affect the ability of such Purchaser to consummate the transactions contemplated hereby.

(j) No Legal, Tax or Investment Advice. Such Purchaser understands that nothing in this Agreement or any other materials presented by or on behalf of the Company to the Purchaser in connection with the purchase of the Securities constitutes legal, tax or investment advice. Such Purchaser has consulted such legal, tax and investment advisors as it, in its sole discretion, has deemed necessary or appropriate in connection with its purchase of the Securities. Such Purchaser understands that the Advisors have acted solely as the agents of and advisors to the Company in this placement of the Securities and not as agents to or advisors of the Purchaser, and that the Advisors make no representation or warranty with regard to the merits of this transaction or as to the accuracy of any information such Purchaser may have received in connection therewith. Such Purchaser acknowledges that he has not relied on any information or advice furnished by or on behalf of the Advisors.

The Company acknowledges and agrees that the representations contained in this Section 3.2 shall not modify, amend or affect such Purchaser's right to rely on the Company's representations and warranties contained in this Agreement or any representations and warranties contained in any other Transaction Document or any other document or instrument executed or delivered in connection with this Agreement or the consummation of the transactions contemplated hereby.

**ARTICLE IV.
OTHER AGREEMENTS OF THE PARTIES**

4.1 Transfer Restrictions.

(a) The Securities may only be disposed of in compliance with state and federal securities laws. In connection with any transfer of Securities other than pursuant to an effective registration statement or Rule 144, to the Company or to an Affiliate of a Purchaser or in connection with a pledge as contemplated in Section 4.1(b), the Company may require the transferor thereof to provide to the Company an opinion of counsel selected by the transferor and reasonably acceptable to the Company, the form and substance of which opinion shall be reasonably satisfactory to the Company, to the effect that such transfer does not require registration of such transferred Securities under the Securities Act. As a condition of transfer, any such transferee shall agree in writing to be bound by the terms of this Agreement and shall have the rights and obligations of a Purchaser under this Agreement. Notwithstanding the foregoing, the Company hereby consents to and agrees to register on the books of the Company and with its Transfer Agent, without any such legal opinion, except to the extent that the Transfer Agent requests such legal opinion, any transfer of Securities by a Purchaser to an Affiliate of such Purchaser, provided that the transferee certifies to the Company that it is an "accredited investor" as defined in Rule 501(a) under the Securities Act and provided that such Affiliate does not request any removal of any existing legends on any certificate evidencing the Securities.

(b) The Purchasers agree to the imprinting, so long as is required by this Section 4.1, of a legend on any of the Securities in the following form:

THIS SECURITY HAS NOT BEEN REGISTERED WITH THE SECURITIES AND EXCHANGE COMMISSION OR THE SECURITIES COMMISSION OF ANY STATE IN RELIANCE UPON AN EXEMPTION FROM REGISTRATION UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), AND, ACCORDINGLY, MAY NOT BE OFFERED OR SOLD EXCEPT PURSUANT TO AN EFFECTIVE REGISTRATION STATEMENT UNDER THE SECURITIES ACT OR PURSUANT TO AN AVAILABLE EXEMPTION FROM, OR IN A TRANSACTION NOT SUBJECT TO, THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT AND IN ACCORDANCE WITH APPLICABLE STATE SECURITIES LAWS. THIS SECURITY MAY BE PLEDGED IN CONNECTION WITH A BONA FIDE MARGIN ACCOUNT WITH A REGISTERED BROKER-DEALER OR OTHER LOAN WITH A FINANCIAL INSTITUTION THAT IS AN "ACCREDITED INVESTOR" AS DEFINED IN RULE 501(a) UNDER THE SECURITIES ACT OR OTHER LOAN SECURED BY SUCH SECURITIES.

The Company acknowledges and agrees (except as prohibited by law) that a Purchaser may from time to time pledge pursuant to a bona fide margin agreement or other loan or financing arrangement secured by the Securities with a registered broker-dealer or grant a security interest in some or all of the Securities to a financial institution that is an “accredited investor” as defined in Rule 501(a) under the Securities Act and who agrees to be bound by the provisions of this Agreement and, if required under the terms of such arrangement, such Purchaser may transfer pledged or secured Securities to the pledgees or secured parties. Except as required by law, such a pledge or transfer would not be subject to approval of the Company and no legal opinion of legal counsel of the pledgee, secured party or pledgor shall be required in connection therewith. Further, no notice shall be required of such pledge. Each Purchaser acknowledges that the Company shall not be responsible for any pledges relating to, or the grant of any security interest in, any of the Securities or for any agreement, understanding or arrangement between any Purchaser and its pledgee or secured party. At the appropriate Purchaser’s expense, the Company will execute and deliver such reasonable documentation as a pledgee or secured party of Securities may reasonably request in connection with a pledge or transfer of the Securities, including, if the Securities are subject to registration pursuant to this Agreement, the preparation and filing of any required prospectus supplement under Rule 424(b)(3) under the Securities Act or other applicable provision of the Securities Act to appropriately amend the list of selling stockholders. Provided that the Company is in compliance with the terms of this Section 4.1(b), the Company’s indemnification obligations pursuant to Section 4.8 shall not extend to any Proceeding or Losses arising out of or related to this Section 4.1(b).

(c) Certificates evidencing the Shares and Warrant Shares shall not contain any legend (including the legend set forth in Section 4.1(b) hereof), (i) while a registration statement (including the Registration Statement) covering the resale of such security is effective under the Securities Act, (ii) in connection with a sale, assignment or other transfer, in which a holder of the Shares or Warrant Shares provides the Company with an opinion of counsel, the form and substance of which opinion shall be reasonably acceptable to the Company, that the sale, assignment or transfer of the Shares or Warrant Shares may be made without registration under the applicable requirements of the Securities Act, (iii) following any sale of such Shares or Warrant Shares pursuant to Rule 144, (iv) if such Shares or Warrant Shares are eligible for sale under Rule 144, without the requirement for the Company to be in compliance with the current public information required under Rule 144 as to such Shares and Warrant Shares and without volume or manner-of-sale restrictions, or (v) if such legend is not required under applicable requirements of the Securities Act (including judicial interpretations and pronouncements issued by the staff of the Commission). The Company shall cause its counsel to issue a legal opinion to the Transfer Agent promptly after the Effective Date (but no later than 3 Business Days after the Effective Date) if required by the Transfer Agent to effect the removal of the legend hereunder. If all or any portion of a Warrant is exercised at a time when there is an effective registration statement to cover the resale of the Warrant Shares, or if such Shares or Warrant Shares may be sold under Rule 144 and the Company is then in compliance with the current public information required under Rule 144, or if the Shares or Warrant Shares may be sold under Rule 144 without the requirement for the Company to be in compliance with the current public information required under Rule 144 as to such Shares or Warrant Shares or if such legend is not otherwise required under applicable requirements of the Securities Act (including judicial interpretations and pronouncements issued by the staff of the Commission) then such Shares and Warrant Shares shall be issued free of all legends. The Company agrees that following the Effective Date or at such time as such legend is no longer required under this Section 4.1(c), it will, no later than three Trading Days following the delivery by a Purchaser to the Company or the Transfer Agent of a certificate representing the Shares or Warrant Shares, as the case may be, issued with a restrictive legend (such third Trading Day, the “Legend Removal Date”), deliver or cause to be delivered to such Purchaser a certificate representing such shares that is free from all restrictive and other legends. The Company may not make any notation on its records or give instructions to the Transfer Agent that enlarge the restrictions on transfer set forth in this Section 4. Certificates for Shares or Warrant Shares subject to legend removal hereunder shall be transmitted by the Transfer Agent to the Purchaser by crediting the account of the Purchaser’s prime broker with the Depository Trust Company System as directed by such Purchaser.

(d) In addition to such Purchaser's other available remedies, if the Company fails to issue and deliver (or cause to be delivered) to a Purchaser by the required delivery date a certificate representing the Securities so delivered to the Company by such Purchaser that is free from all restrictive and other legends, the Company shall pay to a Purchaser, in cash, as partial liquidated damages and not as a penalty, an amount equal to 1% of the product of (A) the aggregate number of shares of Common Stock not issued to the Holder on a timely basis and to which the Holder is entitled and (B) the Closing Sale Price on the Trading Day immediately preceding the required delivery date of the certificate, per Trading Day for each Trading Day after such required delivery date until such Securities are delivered to the Purchaser. In addition, if the Company fails to (i) issue and deliver (or cause to be delivered) to a Purchaser by the required delivery date a certificate representing the Securities so delivered to the Company by such Purchaser that is free from all restrictive and other legends or (ii) if after the required delivery date such Purchaser purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by such Purchaser of all or any portion of the number of shares of Common Stock, or a sale of a number of shares of Common Stock equal to all or any portion of the number of shares of Common Stock that such Purchaser anticipated receiving from the Company without any restrictive legend, then, the Company shall either (i) pay cash to the Purchaser in an amount equal to the Purchaser's total purchase price (including brokerage commissions and other out-of-pocket expenses, if any) for the shares of Common Stock so purchased (the "Buy-In Price"), over the product of (A) such number of shares of Common Stock that the Company was required to deliver to such Purchaser by the Legend Removal Date multiplied by (B) the lowest closing sale price of the Common Stock on any Trading Day during the period commencing on the date of the delivery by such Purchaser to the Company of the applicable Shares (as the case may be) and ending on the date of such delivery and payment under this clause (ii).

(e) Each Purchaser, severally and not jointly with the other Purchasers, agrees with the Company that such Purchaser will sell any Securities pursuant to either the registration requirements of the Securities Act, including any applicable prospectus delivery requirements, or an exemption therefrom, and that if Securities are sold pursuant to a Registration Statement, they will be sold in compliance with the plan of distribution set forth therein, and acknowledges that the removal of the restrictive legend from certificates representing Securities as set forth in this Section 4.1 is predicated upon the Company's reliance upon this understanding.

4.2 Furnishing of Information; Public Information.

(a) Until no Purchaser owns any Securities or unexpired Warrants, the Company covenants to maintain the registration of the Common Stock under Section 12(b) or 12(g) of the Exchange Act and to timely file (or obtain extensions in respect thereof and file within the applicable grace period) all reports required to be filed by the Company after the date hereof pursuant to the Exchange Act even if the Company is not then subject to the reporting requirements of the Exchange Act.

(b) At any time during the period commencing from the six (6) month anniversary of the date hereof and ending at such time that all of the Securities may be sold without the requirement for the Company to be in compliance with Rule 144(c)(1) and otherwise without restriction or limitation pursuant to Rule 144, if the Company (i) shall fail for any reason to satisfy the current public information requirement under Rule 144(c) or (ii) has ever been an issuer described in Rule 144(i)(1)(i) or becomes an issuer in the future, and the Company shall fail to satisfy any condition set forth in Rule 144(i)(2) (a "Public Information Failure") then, in addition to such Purchaser's other available remedies, the Company shall pay to a Purchaser, in cash, as partial liquidated damages and not as a penalty, by reason of any such delay in or reduction of its ability to sell the Securities, an amount in cash equal to one percent (1.0%) of the aggregate Subscription Amount of such Purchaser's Securities on the day of a Public Information Failure and on every thirtieth (30th) day (pro-rated for periods totaling less than thirty days) thereafter until the earlier of (a) the date such Public Information Failure is cured and (b) such time that such public information is no longer required for the Purchasers to transfer the Shares and Warrant Shares pursuant to Rule 144. The payments to which a Purchaser shall be entitled pursuant to this Section 4.2(b) are referred to herein as "Public Information Failure Payments." Public Information Failure Payments shall be paid on the earlier of (i) the last day of the calendar month during which such Public Information Failure Payments are incurred and (ii) the third (3rd) Business Day after the event or failure giving rise to the Public Information Failure Payments is cured. In the event the Company fails to make Public Information Failure Payments in a timely manner, such Public Information Failure Payments shall bear interest at the rate of 1.5% per month (prorated for partial months) until paid in full. Nothing herein shall limit such Purchaser's right to pursue actual damages for the Public Information Failure, and such Purchaser shall have the right to pursue all remedies available to it at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief.

4.3 Integration. The Company shall not sell, offer for sale or solicit offers to buy or otherwise negotiate in respect of any security (as defined in Section 2 of the Securities Act) that would be integrated with the offer or sale of the Securities in a manner that would require the registration under the Securities Act of the sale of the Securities or that would be integrated with the offer or sale of the Securities for purposes of the rules and regulations of any Trading Market such that it would require shareholder approval prior to the closing of such other transaction unless shareholder approval is obtained before the closing of such subsequent transaction.

4.4 Securities Laws Disclosure; Publicity. The Company shall (a) by 8:30 a.m. (New York City time) on the Trading Day immediately following the date hereof, issue a press release disclosing the material terms of the transactions contemplated hereby, and (b) file a Current Report on Form 8-K, including the Transaction Documents as exhibits thereto, with the Commission within the time required by the Exchange Act. Thereafter, the Company shall timely file any filings and notices required by the Commission or applicable law with respect to the transactions contemplated hereby and provide copies thereof to the Purchasers promptly after filing (to the extent that such filing or notice is not available on EDGAR). From and after the issuance of such press release, the Company represents to the Purchasers that it shall have publicly disclosed all material, non-public information delivered to any of the Purchasers by the Company or any of its Subsidiaries, or any of their respective officers, directors, employees or agents in connection with the transactions contemplated by the Transaction Documents. In addition, effective upon the issuance of such press release, the Company acknowledges and agrees that any and all confidentiality or similar obligations under any agreement, whether written or oral, between the Company, any of its Subsidiaries or any of their respective officers, directors, agents, employees or Affiliates on the one hand, and any of the Purchasers or any of their Affiliates on the other hand, shall terminate. The Company and each Purchaser shall consult with each other in issuing any other press releases with respect to the transactions contemplated hereby, and neither the Company nor any Purchaser shall issue any such press release nor otherwise make any such public statement without the prior consent of the Company, with respect to any press release of any Purchaser, or without the prior consent of each Purchaser, with respect to any press release of the Company, which consent shall not unreasonably be withheld or delayed, except if such disclosure is required by law, in which case the disclosing party shall promptly provide the other party with prior notice of such public statement or communication. Notwithstanding the foregoing, the Company shall not publicly disclose the name of any Purchaser, or include the name of any Purchaser in any filing with the Commission or any regulatory agency or Trading Market, without the prior written consent of such Purchaser, except: (a) as required by federal securities law in connection with (i) any registration statement contemplated by Article V of this Agreement and (ii) the filing of final Transaction Documents with the Commission and (b) to the extent such disclosure is required by law or Trading Market regulations, in which case the Company shall provide the Purchasers with prior notice of such disclosure permitted under this clause (b). The Company agrees not to use the name of, or any information regarding, Merck Global Health Innovation Fund, LLC (or any affiliated company of Merck Global Health Innovation Fund, LLC), in any press release, public disclosure, promotional materials or public relations for the Company, except as expressly permitted above or by separate written agreement of Merck Global Health Innovation Fund, LLC (or any affiliated company of Merck Global Health Innovation Fund, LLC). The foregoing covenant shall continue so long as Merck Global Health Innovation Fund, LLC owns any shares in the Company.

4.5 Shareholder Rights Plan. No claim will be made or enforced by the Company or, with the consent of the Company, any other Person, that any Purchaser is an “Acquiring Person” under any control share acquisition, business combination, poison pill (including any distribution under a rights agreement) or similar anti-takeover plan or arrangement in effect or hereafter adopted by the Company, or that any Purchaser could be deemed to trigger the provisions of any such plan or arrangement, by virtue of receiving Securities under the Transaction Documents or under any other agreement between the Company and the Purchasers.

4.6 Non-Public Information. Except with respect to the material terms and conditions of the transactions contemplated by the Transaction Documents, which shall be disclosed pursuant to Section 4.4, the Company covenants and agrees that neither it, nor any other Person acting on its behalf will provide any Purchaser (other than Excluded Purchasers) or its agents or counsel with any information that constitutes, or the Company reasonably believes constitutes, material non-public information, unless prior thereto such Purchaser shall have consented to the receipt of such information and agreed with the Company to keep such information confidential. The Company understands and confirms that each Purchaser shall be relying on the foregoing covenant in effecting transactions in securities of the Company (other than Excluded Purchasers). To the extent that the Company delivers any material, non-public information to a Purchaser without such Purchaser’s consent, the Company hereby covenants and agrees that such purchaser shall not have any duty of confidentiality to Company, any of its Subsidiaries, or any of their respective officers, directors, agents, employees or Affiliates, or a duty to the Company, and of its Subsidiaries or any of their respective officers, directors, agents, employees or Affiliates not to trade on the basis of, such material, non-public information, provided that the Purchaser shall remain subject to applicable law. To the extent that any notice provided pursuant to any Transaction Document constitutes, or contains, material, non-public information regarding the Company or any Subsidiaries, the Company shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Company understands and confirms that each Purchaser shall be relying on the foregoing covenant in effecting transactions in securities of the Company.

4.7 Use of Proceeds. The Company shall use the net proceeds from the sale of the Securities hereunder for working capital purposes and shall not use such proceeds: (a) for the satisfaction of any portion of the Company’s debt (other than payment of trade payables in the ordinary course of the Company’s business and prior practices), (b) for the redemption of any Common Stock or Common Stock Equivalents, (c) for the settlement of any outstanding litigation or (d) in violation of FCPA or OFAC regulations.

4.8 Indemnification of Purchasers. The Company shall, notwithstanding any termination of this Agreement, indemnify and hold harmless each Purchaser, the officers, directors, partners, members, agents and employees of each of them, each Person who controls any such Purchaser (within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act) and the officers, directors, partners, members, agents and employees of each such controlling Person, to the fullest extent permitted by applicable law, from and against any and all Losses, as incurred, arising out of or relating to (i) any misrepresentation or breach of any representation or warranty made by the Company in the Transaction Documents or any other certificate, instrument or document contemplated hereby or thereby, (ii) any breach of any covenant, agreement or obligation of the Company contained in the Transaction Documents or any other certificate, instrument or document contemplated hereby or thereby, (iii) any cause of action, suit or claim brought or made against such Indemnified Party (as defined below) by a third party (including for these purposes a derivative action brought on behalf of the Company), arising out of or resulting from (x) execution, delivery, performance or enforcement of the Transaction Documents or any other certificate, instrument or document contemplated hereby or thereby, (y) any transaction financed or to be financed in whole or in part, directly or indirectly, with the proceeds of the issuance of the Securities, or (z) the status of Indemnified Party as holder of the Securities or (iv) any untrue or alleged untrue statement of a material fact contained in the Registration Statement, any Prospectus or any form of Company prospectus or in any amendment or supplement thereto or in any Company preliminary prospectus, or arising out of or relating to any omission or alleged omission of a material fact required to be stated therein or necessary to make the statements therein (in the case of any Prospectus or form of prospectus or supplement thereto, in the light of the circumstances under which they were made) not misleading, except to the extent, but only to the extent, that (A) such untrue statements, alleged untrue statements, omissions or alleged omissions are based solely upon information regarding such Purchaser furnished in writing to the Company by such Purchaser for use therein, or to the extent that such information relates to such Purchaser or such Purchaser’s proposed method of distribution of Registrable Securities and was reviewed and expressly approved by such Purchaser expressly for use in the Registration Statement, or (B) with respect to any prospectus, if the untrue statement or omission of material fact contained in such prospectus was corrected on a timely basis in the prospectus, as then amended or supplemented, if such corrected prospectus was timely made available by the Company to the holder of the Securities, and the holder of the Securities seeking indemnity hereunder was advised in writing not to use the incorrect prospectus prior to the use giving rise to Losses.

4.9 Indemnification by Purchasers. Each Purchaser shall, severally and not jointly, indemnify and hold harmless the Company, its directors, officers, agents and employees, each Person who controls the Company (within the meaning of Section 15 of the Securities Act and Section 20 of the Exchange Act), and the directors, officers, agents or employees of such controlling Persons, to the fullest extent permitted by applicable law, from and against all Losses as incurred, arising out of or relating to any untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, any Prospectus, or any form of prospectus, or in any amendment or supplement thereto, or arising out of or relating to any omission of a material fact required to be stated therein or necessary to make the statements therein (in the case of any Prospectus or form of prospectus or supplement thereto, in the light of the circumstances under which they were made) not misleading, but only to the extent that such untrue statement or omission is contained in any information so furnished by such Purchaser in writing to the Company specifically for inclusion in such Registration Statement or such Prospectus or to the extent that (i) such untrue statements or omissions are based solely upon information regarding such Purchaser furnished to the Company by such Purchaser in writing expressly for use therein, or to the extent that such information relates to such Purchaser or such Purchaser's proposed method of distribution of Registrable Securities and was reviewed and expressly approved by such Purchaser expressly for use in the Registration Statement (it being understood that the information provided by the Purchaser to the Company in Exhibits B-1, B-2 and B-3 and the Plan of Distribution set forth on Exhibit D, as the same may be modified by such Purchaser and other information provided by the Purchaser to the Company in or pursuant to the Transaction Documents constitutes information reviewed and expressly approved by such Purchaser in writing expressly for use in the Registration Statement), such Prospectus or such form of Prospectus or in any amendment or supplement thereto. In no event shall the liability of any selling Purchaser hereunder be greater in amount than the dollar amount of the net proceeds received by such Purchaser upon the sale of the Registrable Securities giving rise to such indemnification obligation.

4.10 Conduct of Indemnification Proceedings. If any Proceeding shall be brought or asserted against any Person entitled to indemnity hereunder (an "Indemnified Party"), such Indemnified Party shall promptly notify the Person from whom indemnity is sought (the "Indemnifying Party") in writing, and the Indemnifying Party shall assume the defense thereof, including the employment of counsel reasonably satisfactory to the Indemnified Party and the payment of all fees and expenses incurred in connection with defense thereof; provided, that the failure of any Indemnified Party to give such notice shall not relieve the Indemnifying Party of its obligations or liabilities pursuant to this Agreement, except (and only) to the extent that such failure to give notice shall materially adversely affect the Indemnifying Party in the defense of any such claim or litigation.

An Indemnified Party shall have the right to employ separate counsel in any such Proceeding and to participate in the defense thereof, but the fees and expenses of such counsel shall be at the expense of such Indemnified Party or Parties unless: (i) the Indemnifying Party has agreed in writing to pay such fees and expenses; or (ii) the Indemnifying Party shall have failed within 45 days of receiving notification of a Proceeding from an Indemnified Party to assume the defense of such Proceeding and to employ counsel reasonably satisfactory to such Indemnified Party in any such Proceeding; or (iii) the named parties to any such Proceeding (including any impleaded parties) include both such Indemnified Party and the Indemnifying Party, and such Indemnified Party shall have been advised by counsel that a conflict of interest is likely to exist if the same counsel were to represent such Indemnified Party and the Indemnifying Party (in which case, if such Indemnified Party notifies the Indemnifying Party in writing that it elects to employ separate counsel at the expense of the Indemnifying Party, the Indemnifying Party shall not have the right to assume the defense thereof and the reasonable fees and expenses of separate counsel shall be at the expense of the Indemnifying Party). It being understood, however, that the Indemnifying Party shall not, in connection with any one such Proceeding (including separate Proceedings that have been or will be consolidated before a single judge) be liable for the fees and expenses of more than one separate firm of attorneys at any time for all Indemnified Parties, which firm shall be appointed by a majority of the Indemnified Parties. The Indemnifying Party shall not be liable for any settlement of any such Proceeding effected without its written consent, which consent shall not be unreasonably withheld. No Indemnifying Party shall, without the prior written consent of the Indemnified Party, effect any settlement of any pending Proceeding in respect of which any Indemnified Party is a party, unless such settlement includes an unconditional release of such Indemnified Party from all liability on claims that are the subject matter of such Proceeding.

All reasonable fees and expenses of the Indemnified Party (including reasonable fees and expenses to the extent incurred in connection with investigating or preparing to defend such Proceeding in a manner not inconsistent with this Section) shall be paid to the Indemnified Party, as incurred, within 20 Trading Days of written notice thereof to the Indemnifying Party (regardless of whether it is ultimately determined that an Indemnified Party is not entitled to indemnification hereunder; provided, that the Indemnifying Party may require such Indemnified Party to undertake to reimburse all such fees and expenses to the extent it is finally judicially determined that such Indemnified Party is not entitled to indemnification hereunder).

4.11 Contribution. If a claim for indemnification under Sections 4.8 and 4.9 is unavailable to an Indemnified Party (by reason of public policy or otherwise), then each Indemnifying Party, in lieu of indemnifying such Indemnified Party, shall contribute to the amount paid or payable by such Indemnified Party as a result of such Losses, in such proportion as is appropriate to reflect the relative fault of the Indemnifying Party and Indemnified Party in connection with the actions, statements or omissions that resulted in such Losses as well as any other relevant equitable considerations. The relative fault of such Indemnifying Party and Indemnified Party shall be determined by reference to, among other things, whether any action in question, including any untrue or alleged untrue statement of a material fact or omission or alleged omission of a material fact, has been taken or made by, or relates to information supplied by, such Indemnifying Party or Indemnified Party, and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent such action, statement or omission. The amount paid or payable by a party as a result of any Losses shall be deemed to include, subject to the limitations set forth in Section 4.10, any reasonable attorneys' or other reasonable fees or expenses incurred by such party in connection with any Proceeding to the extent such party would have been indemnified for such fees or expenses if the indemnification provided for in this Section was available to such party in accordance with its terms.

The parties hereto agree that it would not be just and equitable if contribution pursuant to this Section 4.11 were determined by pro rata allocation or by any other method of allocation that does not take into account the equitable considerations referred to in the immediately preceding paragraph. Notwithstanding the provisions of this Section 4.11, no Purchaser shall be required to contribute, in the aggregate, any amount in excess of the amount by which the proceeds actually received by such Purchaser from the sale of the Registrable Securities subject to the Proceeding exceeds the amount of any damages that such Purchaser has otherwise been required to pay by reason of such untrue or alleged untrue statement or omission or alleged omission. No Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation.

The indemnity and contribution agreements contained in this Section are in addition to any liability that the Indemnifying Parties may have to the Indemnified Parties.

4.12 Reservation of Common Stock. As of the date hereof, the Company has reserved and the Company shall continue to reserve and keep available at all times, free of preemptive rights, a sufficient number of shares of Common Stock for the purpose of enabling the Company to issue the Shares pursuant to this Agreement and Warrant Shares pursuant to any exercise of the Warrants.

4.13 Listing of Common Stock. The Company hereby agrees to use best efforts to maintain the listing or quotation of the Common Stock on the Trading Market on which it is currently listed, and concurrently with the applicable Closing, the Company shall apply to list or quote all of the Shares and Warrant Shares on such Trading Market and promptly secure the listing of all of the Shares and Warrant Shares on such Trading Market. The Company further agrees, if the Company applies to have the Common Stock traded on any other Trading Market, it will then include in such application all of the Shares and Warrant Shares, and will take such other action as is necessary to cause all of the Shares and Warrant Shares to be listed or quoted on such other Trading Market as promptly as possible. The Company will then take all action reasonably necessary to continue the listing or quotation and trading of its Common Stock on a Trading Market and will comply in all respects with the Company's reporting, filing and other obligations under the bylaws or rules of the Trading Market. The Company agrees to maintain the eligibility of the Common Stock for electronic transfer through the Depository Trust Company or another established clearing corporation, including, without limitation, by timely payment of fees to the Depository Trust Company or such other established clearing corporation in connection with such electronic transfer. In addition, the Company hereby agrees to use best efforts to secure, prior to the Secondary Closing, each required Shareholder Approval.

4.14 Participation in Future Financing.

(a) From the date hereof until the 2nd anniversary of the Execution Date, upon any issuance by the Company or any of its Subsidiaries of Common Stock or Common Stock Equivalents for cash consideration, Indebtedness or a combination of units thereof, other than pursuant to the terms of this Agreement (a "Subsequent Financing"), each Purchaser shall have the right to participate in, on a pro rata basis, up to an amount of the Subsequent Financing equal to 100% of the Subsequent Financing (the "Participation Maximum") on the same terms, conditions and price provided for in the Subsequent Financing.

(b) At least one (1) full Trading Day (but no more than two (2) Trading Days) prior to the public announcement of the Subsequent Financing (the “Notice Date”), the Company shall deliver to each Purchaser a written notice of its intention to effect a Subsequent Financing (“Subsequent Financing Notice”). The Subsequent Financing Notice shall describe in reasonable detail the proposed terms of such Subsequent Financing, the amount of proceeds intended to be raised thereunder and the Person or Persons through or with whom such Subsequent Financing is proposed to be effected and shall include a term sheet or similar document relating thereto as an attachment.

(c) Any Purchaser desiring to participate in such Subsequent Financing must provide written notice to the Company by not later than 5:30 p.m. (New York City time) on the Notice Date that the Purchaser is willing to participate in the Subsequent Financing, the amount of the Purchaser’s participation, and representing and warranting that the Purchaser has such funds ready, willing, and available for investment on the terms set forth in the Subsequent Financing Notice. If the Company receives no such notice from a Purchaser as of such time and date, such Purchaser shall be deemed to have notified the Company that it does not elect to participate.

(d) If by 5:30 p.m. (New York City time) on the Notice Date, notifications by the Purchasers of their willingness to participate in the Subsequent Financing (or to cause their designees to participate) is, in the aggregate, less than the total amount of the Subsequent Financing, then the Company may effect the remaining portion of such Subsequent Financing on the terms and with the Persons set forth in the Subsequent Financing Notice.

(e) If by 5:30 p.m. (New York City time) on the Notice Date, the Company receives responses to a Subsequent Financing Notice from Purchasers seeking to purchase more than the aggregate amount of the Participation Maximum, each such Purchaser shall have the right to purchase its Pro Rata Portion (as defined below) of the Participation Maximum. “Pro Rata Portion” means the ratio of (x) the Purchaser’s Subscription Amount of Securities set forth on the signature page hereto executed by such Purchaser participating under this Section 4.14 and (y) the sum of the aggregate Subscription Amounts of Securities purchased on the Primary Closing Date or, if the Secondary Closing shall have occurred, the Primary Closing Date and the Secondary Closing Date by all Purchasers participating under this Section 4.14.

(f) The Company must provide the Purchasers with a second Subsequent Financing Notice, and the Purchasers will again have the right of participation set forth above in this Section 4.14, if the Subsequent Financing subject to the initial Subsequent Financing Notice is not consummated for any reason on the terms set forth in such Subsequent Financing Notice within thirty (30) Trading Days after the date of the initial Subsequent Financing Notice.

(g) The Company and each Purchaser agree that if any Purchaser elects to participate in the Subsequent Financing, the transaction documents related to the Subsequent Financing shall not include any term or provision whereby such Purchaser shall be required to agree to any restrictions on trading as to any of the Securities purchased hereunder or be required to consent to any amendment to or termination of, or grant any waiver, release or the like under or in connection with, this Agreement, without the prior written consent of such Purchaser.

(h) Notwithstanding anything to the contrary in this Section 4.14 and unless otherwise agreed to by such Purchaser, the Company shall either confirm in writing to such Purchaser that the transaction with respect to the Subsequent Financing has been abandoned or shall publicly disclose its intention to issue the securities in the Subsequent Financing, in either case in such a manner such that such Purchaser will not be in possession of any material, non-public information, by the tenth (10th) Business Day following delivery of the Subsequent Financing Notice. If by such tenth (10th) Business Day, no public disclosure regarding a transaction with respect to the Subsequent Financing has been made, and no notice regarding the abandonment of such transaction has been received by such Purchaser, such transaction shall be deemed to have been abandoned and such Purchaser shall not be deemed to be in possession of any material, non-public information with respect to the Company or any of its Subsidiaries.

(i) Notwithstanding the foregoing, this Section 4.14 shall not apply in respect of an Exempt Issuance.

4.15 Subsequent Equity Sales.

(a) From the date hereof until ninety (90) days after the Effective Date, neither the Company nor any Subsidiary shall issue, enter into any agreement to issue or announce the issuance or proposed issuance of any shares of Common Stock or Common Stock Equivalents, except pursuant to existing Company stock incentive plans and proposals to grant stock options as set forth in the Company's definitive proxy statement filed April 29, 2016 with the SEC.

(b) From the date hereof until such time as no Purchaser holds any of the Warrants, the Company shall be prohibited from effecting or entering into an agreement to effect any issuance by the Company or any of its Subsidiaries of Common Stock or Common Stock Equivalents (or a combination of units thereof) involving a Variable Rate Transaction. "Variable Rate Transaction" means a transaction in which the Company (i) issues or sells any debt or equity securities that are convertible into, exchangeable or exercisable for, or include the right to receive, additional shares of Common Stock either (A) at a conversion price, exercise price or exchange rate or other price that is based upon, and/or varies with, the trading prices of or quotations for the shares of Common Stock at any time after the initial issuance of such debt or equity securities or (B) with a conversion, exercise or exchange price that is subject to being reset at some future date after the initial issuance of such debt or equity security or upon the occurrence of specified or contingent events directly or indirectly related to the business of the Company or the market for the Common Stock or (ii) enters into, or effects a transaction under, any agreement, including, but not limited to, an equity line of credit, whereby the Company may issue securities at a future determined price. Any Purchaser shall be entitled to obtain injunctive relief against the Company to preclude any such issuance, which remedy shall be in addition to any right to collect damages.

(c) Notwithstanding the foregoing, this Section 4.15 shall not apply in respect of an Exempt Issuance, except that no Variable Rate Transaction shall be an Exempt Issuance.

4.16 Certain Transactions and Confidentiality. Each Purchaser, severally and not jointly with the other Purchasers, covenants that neither it, nor any Affiliate acting on its behalf or pursuant to any understanding with it will execute any purchases or sales, including Short Sales, of any of the Company's securities during the period commencing with the execution of this Agreement and ending at such time that the transactions contemplated by this Agreement are first publicly announced pursuant to the initial press release as described in Section 4.4. Each Purchaser, severally and not jointly with the other Purchasers, covenants that until such time as the transactions contemplated by this Agreement are publicly disclosed by the Company pursuant to the initial press release as described in Section 4.4, such Purchaser will maintain the confidentiality of the existence and terms of this transaction and the information included in the Transaction Documents and the Disclosure Schedules. Notwithstanding the foregoing, and notwithstanding anything contained in this Agreement to the contrary, the Company expressly acknowledges and agrees that (i) no Purchaser makes any representation, warranty or covenant hereby that it will not engage in effecting transactions in any securities of the Company after the time that the transactions contemplated by this Agreement are first publicly announced pursuant to the initial press release as described in Section 4.4, (ii) no Purchaser shall be restricted or prohibited from effecting any transactions in any securities of the Company in accordance with applicable securities laws from and after the time that the transactions contemplated by this Agreement are first publicly announced pursuant to the initial press release as described in Section 4.4 and (iii) no Purchaser shall have any duty of confidentiality or duty not to trade in the securities of the Company to the Company or its Subsidiaries after the issuance of the initial press release as described in Section 4.4. Notwithstanding the foregoing, in the case of a Purchaser that is a multi-managed investment vehicle whereby separate portfolio managers manage separate portions of such Purchaser's assets and the portfolio managers have no direct knowledge of the investment decisions made by the portfolio managers managing other portions of such Purchaser's assets, the covenant set forth above shall only apply with respect to the portion of assets managed by the portfolio manager that made the investment decision to purchase the Securities covered by this Agreement.

4.17 Form D; Blue Sky Filings. The Company agrees to timely file a Form D with respect to the Securities as required under Regulation D and to provide a copy thereof, promptly upon request of any Purchaser. The Company shall take such action as the Company shall reasonably determine is necessary in order to obtain an exemption for, or to qualify the Securities for, sale to the Purchasers at the applicable Closing under applicable securities or "Blue Sky" laws of the states of the United States, and shall provide evidence of such actions promptly upon request of any Purchaser.

4.18 Equal Treatment of Purchasers. No consideration (including any modification of any Transaction Document) shall be offered or paid to any Person to amend or consent to a waiver or modification of any provision of the Transaction Documents unless the same consideration is also offered to all of the parties to the Transaction Documents. For clarification purposes, this provision constitutes a separate right granted to each Purchaser by the Company and negotiated separately by each Purchaser, and is intended for the Company to treat the Purchasers as a class and shall not in any way be construed as the Purchasers acting in concert or as a group with respect to the purchase, disposition or voting of Securities or otherwise.

ARTICLE V. REGISTRATION RIGHTS

5.1 Registration Statement.

(a) As promptly as possible, and in any event on the Initial Filing Date, the Company shall prepare and file with the Commission a Registration Statement covering the resale of all Registrable Securities for an offering to be made on a continuous basis pursuant to Rule 415. The Registration Statement shall be on Form S-3 (except if the Company is not then eligible to register for resale the Registrable Securities on Form S-3, in which case such registration shall be on another appropriate form in accordance with the Securities Act and the Exchange Act) and shall contain (except if otherwise directed by the Purchasers or requested by the Commission) the "Plan of Distribution" in substantially the form attached hereto as Exhibit D. To the extent the staff of the Commission does not permit all of the Registrable Securities to be registered on the initial Registration Statement filed pursuant to this Section 5.1(a) (the "Initial Registration Statement"), the Company shall file additional Registration Statements (each an "Additional Registration Statement"), as promptly as possible, and in any event on or prior to the Additional Filing Date, successively trying to register on each such Additional Registration Statement the maximum number of remaining Registrable Securities until all of the Registrable Securities have been registered with the Commission.

(b) The Company shall use its best efforts to cause each Registration Statement to be declared effective by the Commission as promptly as possible after the filing thereof, but in any event prior to the applicable Required Effectiveness Date, and shall use its commercially reasonable efforts to keep the Registration Statement continuously effective under the Securities Act until the earlier of the date that all Registrable Securities covered by such Registration Statement have been sold or can be sold publicly without restriction or limitation under Rule 144 (including, without limitation, the requirement to be in compliance with Rule 144(c)(1)) (the “Effectiveness Period”); provided that, upon notification by the Commission that a Registration Statement will not be reviewed or is no longer subject to further review and comments, the Company shall request acceleration of such Registration Statement within five (5) Trading Days after receipt of such notice and request that it becomes effective on 4:00 p.m. New York City time on the effective date and file a prospectus supplement for any Registration Statement, whether or not required under Rule 424 (or otherwise), by 9:00 a.m. New York City time the day after the effective date.

(c) The Company shall notify the Purchasers in writing promptly (and in any event within two Trading Days) after receiving notification from the Commission that a Registration Statement has been declared effective.

(d) Should an Event (as defined below) occur, then upon the occurrence of such Event, and on every monthly anniversary thereof until the applicable Event is cured, the Company shall pay to each Purchaser an amount in cash, as liquidated damages and not as a penalty, equal to one percent (1.0%) of the aggregate Purchase Price of the Registrable Securities then held by the Purchaser. The payments to which a Purchaser shall be entitled pursuant to this Section 5.1(d) are referred to herein as “Event Payments.” Any Event Payments payable pursuant to the terms hereof shall apply on a pro-rated basis for any portion of a month prior to the cure of an Event. In the event the Company fails to make Event Payments in a timely manner, such Event Payments shall bear interest at the rate of one percent (1.0%) per month (prorated for partial months) until paid in full. All prorated calculations made pursuant to this paragraph shall be based upon the actual number of days in such prorated month.

For such purposes, each of the following shall constitute an “Event”:

(i) a Registration Statement is not filed on or prior to its Filing Date or is not declared effective on or prior to its Required Effectiveness Date;

(ii) except as provided for in Section 5.1(e) (the “Excluded Events”), after the Effective Date of a Registration Statement, a Purchaser is not permitted to sell Registrable Securities under the Registration Statement (or a subsequent Registration Statement filed in replacement thereof) for any reason (other than the fault of such Purchaser) for five or more Trading Days (whether or not consecutive); provided, that in no event shall the time period between the sale of all securities subject to a Registration Statement and the filing and effectiveness of any Additional Registration Statement, as contemplated by Section 5.1(a), constitute an Event;

(iii) except as a result of the Excluded Events, the Common Stock is not listed or quoted, or is suspended from trading, on a Trading Market for a period of three Trading Days (which need not be consecutive Trading Days) during the Effectiveness Period; and

(iv) at any time during the period commencing from the six (6) month anniversary of the Primary Closing Date and ending at the termination of the Effectiveness Period, if a Registration Statement is not available for the resale of all of the Registrable Securities and the Company shall fail for any reason to satisfy the current public information requirement under Rule 144(c).

(e) Notwithstanding anything in this Agreement to the contrary, after 60 consecutive Trading Days of continuous effectiveness of the Initial Registration Statement, the Company may, by written notice to the Purchasers, suspend sales under a Registration Statement after the Effective Date thereof and/or require that the Purchasers immediately cease the sale of shares of Common Stock pursuant thereto and/or defer the filing of any subsequent Registration Statement if effecting or maintaining the effectiveness of the Registration Statement would (i) require premature disclosure of material information that the Company has a bona fide business purpose for preserving as confidential, (ii) render the Company unable to comply with the requirements under the Securities Act or Exchange Act, or (iii) if the Company is engaged in a material merger, acquisition or sale and the Board of Directors determines in good faith, by appropriate resolutions, that, as a result of such activity, it would be materially detrimental to the Company (other than as relating solely to the price of the Common Stock) to maintain a Registration Statement at such time. Upon receipt of such notice and a certificate signed by the Company's chief executive officer stating that such decision had been made in good faith judgment of the Board of Directors, each Purchaser shall immediately discontinue any sales of Registrable Securities pursuant to such registration until such Purchaser is advised in writing by the Company that the current Prospectus or amended Prospectus, as applicable, may be used. In no event, however, shall this right be exercised to suspend sales beyond the period during which (in the good faith determination of the Board of Directors) the failure to require such suspension would be materially detrimental to the Company. The Company's rights under this Section may be exercised for a period of no more than 20 Trading Days at a time and not more than two times in any twelve-month period, without such suspension being considered as part of an Event Payment determination. Immediately after the end of any suspension period under this Section the Company shall take all necessary actions (including filing any required supplemental prospectus) to restore the effectiveness of the applicable Registration Statement and the ability of the Purchasers to publicly resell their Registrable Securities pursuant to such effective Registration Statement.

(f) The Company shall not, from the date hereof until the Effective Date of the Initial Registration Statement, prepare and file with the Commission a registration statement relating to an offering for its own account or the account of others under the Securities Act of any of its equity securities, other than any registration statement or post-effective amendment to a registration statement (or supplement thereto) relating to the Company's employee benefit plans registered on Form S-8.

(g) The Company shall not grant registration rights to any existing or future holder of the Company's securities without the prior approval of the Purchasers, which approval shall not be unreasonably withheld.

5.2 Registration Procedures. In connection with the Company's registration obligations hereunder, the Company shall:

(a) Not less than three Trading Days prior to the filing of a Registration Statement or any related Prospectus or any amendment or supplement thereto, furnish via email to those Purchasers who have supplied the Company with email addresses copies of all such documents proposed to be filed, which documents (other than any document that is incorporated or deemed to be incorporated by reference therein) will be subject to the review of such Purchasers. The Company shall reflect in each such document when so filed with the Commission such comments regarding the Purchasers and the plan of distribution as the Purchasers may reasonably and promptly propose no later than two Trading Days after the Purchasers have been so furnished with copies of such documents as aforesaid.

(b) (i) Subject to Section 5.1(e), prepare and file with the Commission such amendments, including post-effective amendments, to each Registration Statement and the Prospectus used in connection therewith as may be necessary to keep the Registration Statement continuously effective, as to the applicable Registrable Securities for the Effectiveness Period and prepare and file with the Commission such additional Registration Statements in order to register for resale under the Securities Act all of the Registrable Securities; (ii) cause the related Prospectus to be amended or supplemented by any required Prospectus supplement, and as so supplemented or amended to be filed pursuant to Rule 424; and (iii) comply in all material respects with the provisions of the Securities Act and the Exchange Act with respect to the disposition of all Registrable Securities covered by the Registration Statement during the applicable period in accordance with the intended methods of disposition by the Commission thereof set forth in the Registration Statement as so amended or in such Prospectus as so supplemented.

(c) Notify the Purchasers as promptly as reasonably possible, and if requested by the Purchasers, confirm such notice in writing no later than two Trading Days thereafter, of any of the following events: (i) the Commission notifies the Company whether there will be a "review" of any Registration Statement; (ii) any Registration Statement or any post-effective amendment is declared effective; (iii) the Commission issues any stop order suspending the effectiveness of any Registration Statement or initiates any Proceedings for that purpose; (iv) the Company receives notice of any suspension of the qualification or exemption from qualification of any Registrable Securities for sale in any jurisdiction, or the initiation or threat of any Proceeding for such purpose; or (v) the financial statements included in any Registration Statement become ineligible for inclusion therein or any Registration Statement or Prospectus or other document contains any untrue statement of a material fact or omits to state any material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading.

(d) Use its commercially reasonable efforts to avoid the issuance of or, if issued, obtain the withdrawal of (i) any order suspending the effectiveness of any Registration Statement, or (ii) any suspension of the qualification (or exemption from qualification) of any of the Registrable Securities for sale in any jurisdiction, as soon as possible.

(e) If requested by a Purchaser, provide such Purchaser and EGS, without charge, at least one conformed copy of each Registration Statement and each amendment thereto, including financial statements and schedules, and all exhibits to the extent requested by such Person (including those previously furnished or incorporated by reference) promptly after the filing of such documents with the Commission.

(f) Promptly deliver to each Purchaser, without charge, as many copies of the Prospectus or Prospectuses (including each form of prospectus) and each amendment or supplement thereto as such Persons may reasonably request. The Company hereby consents to the use of such Prospectus and each amendment or supplement thereto by each of the selling Purchasers in connection with the offering and sale of the Registrable Securities covered by such Prospectus and any amendment or supplement thereto to the extent permitted by federal and state securities laws and regulations.

(g) (i) In the time and manner required by each Trading Market on which the Common Stock is listed, prepare and file with such Trading Market an additional listing application covering all of the Registrable Securities; (ii) take all steps necessary to cause such Registrable Securities to be approved for listing on each such Trading Market as soon as possible thereafter; (iii) provide to each Purchaser evidence of such approval; and (iv) except as a result of the Excluded Events, during the Effectiveness Period, maintain the listing of such Registrable Securities on each such Trading Market or another Trading Market.

(h) Prior to any public offering of Registrable Securities, use its commercially reasonable efforts to register or qualify or cooperate with the selling Purchasers in connection with the registration or qualification (or exemption from such registration or qualification) of such Registrable Securities for offer and sale under the securities or Blue Sky laws of such jurisdictions within the United States as any Purchaser requests in writing, to keep each such registration or qualification (or exemption therefrom) effective for so long as required, but not to exceed the duration of the Effectiveness Period, and to do any and all other acts or things reasonably necessary or advisable to enable the disposition in such jurisdictions of the Registrable Securities covered by a Registration Statement; provided, however, that the Company shall not be obligated to file any general consent to service of process or to qualify as a foreign corporation or as a dealer in securities in any jurisdiction in which it is not so qualified or to subject itself to taxation in respect of doing business in any jurisdiction in which it is not otherwise so subject.

(i) Cooperate with the Purchasers to facilitate the timely preparation and delivery of certificates representing Registrable Securities to be delivered to a transferee pursuant to a Registration Statement, which certificates shall be free, to the extent permitted by this Agreement and under law, of all restrictive legends, and to enable such Registrable Securities to be in such denominations and registered in such names as any such Purchasers may reasonably request.

(j) Upon the occurrence of any event described in Section 5.2(c)(iv), as promptly as reasonably possible, prepare a supplement or amendment, including a post-effective amendment, to the Registration Statement or a supplement to the related Prospectus or any document incorporated or deemed to be incorporated therein by reference, and file any other required document so that, as thereafter delivered, neither the Registration Statement nor such Prospectus will contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which they were made, not misleading.

(k) Cooperate with any reasonable due diligence investigation undertaken by the Purchasers in connection with the sale of Registrable Securities, including, without limitation, by making available documents and information; provided that the Company will not deliver or make available to any Purchaser material, nonpublic information unless such Purchaser requests in advance in writing to receive material, nonpublic information and agrees to keep such information confidential.

(l) Comply with all rules and regulations of the Commission applicable to the registration of the Registrable Securities.

(m) It shall be a condition precedent to the obligations of the Company to complete the registration pursuant to this Agreement with respect to the Registrable Securities of any particular Purchaser or to make any Event Payments set forth in Section 5.1(d) to such Purchaser that such Purchaser furnish to the Company the information specified in Exhibits B-1, B-2 and B-3 hereto and such other information regarding itself, the Registrable Securities and other shares of Common Stock held by it and the intended method of disposition of the Registrable Securities held by it (if different from the Plan of Distribution set forth on Exhibit D hereto) as shall be reasonably required to effect the registration of such Registrable Securities and shall complete and execute such documents in connection with such registration as the Company may reasonably request.

(n) The Company shall comply with all applicable rules and regulations of the Commission under the Securities Act and the Exchange Act, including, without limitation, Rule 172 under the Securities Act, file any final Prospectus, including any supplement or amendment thereof, with the Commission pursuant to Rule 424 under the Securities Act, promptly inform the Purchasers in writing if, at any time during the Effectiveness Period, the Company does not satisfy the conditions specified in Rule 172 and, as a result thereof, the Purchasers are required to make available a Prospectus in connection with any disposition of Registrable Securities and take such other actions as may be reasonably necessary to facilitate the registration of the Registrable Securities hereunder.

(o) Not identify any Purchaser as an underwriter without its prior written consent in any public disclosure or filing with the Commission or any Trading Market and any Purchaser being deemed an underwriter by the Commission shall not relieve the Company of any obligations it has under this Agreement; provided, however, that the foregoing shall not prohibit the Company from including the disclosure found in the "Plan of Distribution" section attached hereto as Exhibit D in the Registration Statement. In addition, and notwithstanding anything to the contrary contained herein, if the Company has received a comment by the Commission requiring an Purchaser to be named as an underwriter in the Registration Statement (which notwithstanding the reasonable best efforts of the Company is not withdrawn by the Commission) and such Purchaser elects in writing not to be named as a selling stockholder in the Registration Statement, the Purchaser shall not be entitled to any Event Payments with respect to such Registration Statement.

5.3 Registration Expenses. The Company shall pay all fees and expenses incident to the performance of or compliance with Article V of this Agreement by the Company, including without limitation (a) all registration and filing fees and expenses, including without limitation those related to filings with the Commission, any Trading Market, any required filing with FINRA by the placement agent, and in connection with applicable state securities or Blue Sky laws, (b) printing expenses (including without limitation expenses of printing certificates for Registrable Securities), (c) reasonable messenger, telephone and delivery expenses, (d) fees and disbursements of counsel for the Company and counsel for each Purchaser, (e) fees and expenses of all other Persons retained by the Company in connection with the consummation of the transactions contemplated by this Agreement, and (f) all listing fees to be paid by the Company to the Trading Market.

5.4 Dispositions. Each Purchaser agrees that it will comply with the prospectus delivery requirements of the Securities Act as applicable to it in connection with sales of Registrable Securities pursuant to the Registration Statement and shall sell its Registrable Securities in accordance with the Plan of Distribution set forth in the Prospectus. Each Purchaser further agrees that, upon receipt of a notice from the Company of the occurrence of any event of the kind described in Sections 5.2(c)(iii), (iv) or (v), such Purchaser will discontinue disposition of such Registrable Securities under the Registration Statement until such Purchaser is advised in writing by the Company that the use of the Prospectus, or amended Prospectus, as applicable, may be used. The Company may provide appropriate stop orders to enforce the provisions of this paragraph. Each Purchaser, severally and not jointly with the other Purchasers, agrees that the removal of the restrictive legend from certificates representing Securities as set forth in Section 4.1 is predicated upon the Company's reliance that the Purchaser will comply with the provisions of this subsection.

5.5 Piggyback Limitations. Neither the Company nor any of its security holders (other than the Purchasers in such capacity pursuant hereto and the shares of Common Stock issuable upon exercise of the warrants issued to Maxim Partners LLC in connection with the Company's initial public offering) may include securities of the Company in the Registration Statement other than the Registrable Securities.

5.6 Piggyback Registrations. If at any time during the Effectiveness Period there is not an effective Registration Statement covering all of the Registrable Securities and the Company shall determine to prepare and file with the Commission a registration statement relating to an offering for its own account or the account of others under the Securities Act of any of its equity securities, other than on Form S-3 with respect to an "at-the-market offering" as defined in Rule 415(a)(4) under the Securities Act or on Form S-4 or Form S-8 (each as promulgated under the Securities Act) or their then equivalents relating to equity securities to be issued solely in connection with any acquisition of any entity or business or equity securities issuable in connection with stock option or other employee benefit plans, then the Company shall send to each Purchaser not then eligible to sell all of their Registrable Securities without restriction or limitation under Rule 144 (including, without limitation, requirement to be in compliance with Rule 144(c)(1)), written notice of such determination and if, within ten days after receipt of such notice, any such Purchaser shall so request in writing, the Company shall include in such registration statement all or any part of such Registrable Securities such Purchaser requests to be registered. Notwithstanding the foregoing, in the event that, in connection with any underwritten public offering, the managing underwriter(s) thereof shall impose a limitation on the number of shares of Common Stock which may be included in the Registration Statement because, in such underwriter(s)' judgment, marketing or other factors dictate such limitation is necessary to facilitate public distribution, then the Company shall be obligated to include in such Registration Statement only such limited portion of the Registrable Securities with respect to which such Purchaser has requested inclusion hereunder as the underwriter shall permit; *provided, however*, that (i) the Company shall not exclude any Registrable Securities unless the Company has first excluded all outstanding securities, the holders of which are not contractually entitled to inclusion of such securities in such Registration Statement or are not contractually entitled to pro rata inclusion with the Registrable Securities and (ii) after giving effect to the immediately preceding proviso, any such exclusion of Registrable Securities shall be made pro rata among the Purchasers seeking to include Registrable Securities and the holders of other securities having the contractual right to inclusion of their securities in such Registration Statement by reason of demand registration rights, in proportion to the number of Registrable Securities or other securities, as applicable, sought to be included by each such Purchaser or other holder. If an offering in connection with which a Purchaser is entitled to registration under this Section 5.6 is an underwritten offering, then each Purchaser whose Registrable Securities are included in such Registration Statement shall, unless otherwise agreed by the Company, offer and sell such Registrable Securities in an underwritten offering using the same underwriter or underwriters and, subject to the provisions of this Agreement, on the same terms and conditions as other shares of Common Stock included in such underwritten offering and shall enter into an underwriting agreement in a form and substance reasonably satisfactory to the Company and the underwriter or underwriters. Upon the effectiveness the registration statement for which piggy-back registration has been provided in this Section 5.6, any Event Payments payable to a Purchaser whose Shares and Warrant Shares are included in such registration statement shall terminate.

**ARTICLE VI.
MISCELLANEOUS**

6.1 **Termination.** This Agreement may be terminated by any Purchaser, as to such Purchaser's obligations hereunder only and without any effect whatsoever on the obligations between the Company and the other Purchasers, by written notice to the other parties, if the Primary Closing has not been consummated on or before the third Business Day following the date hereof; and may be terminated by Merck Global Health Innovation Fund, LLC, as to its obligations hereunder only and without any effect whatsoever on the obligations between the Company and the other Purchasers, by written notice to the other parties, if the Secondary Closing has not been consummated on or before the third Business Day following the receipt of the Shareholder Approval and the satisfaction of the 20 calendar day waiting period required by Rule 14c-2(b) under the Exchange Act; provided, however, that in each such case such termination will not affect the right of any party to sue for any breach by any other party (or parties). Notwithstanding anything in this Agreement to the contrary, if the Company has not secured the Shareholder Approval within 30 days of the Primary Closing Date, Merck Global Health Innovation Fund, LLC's obligations in respect of the Secondary Closing shall terminate.

6.2 **Fees and Expenses.** The Company shall deliver to each applicable Purchaser, prior to the applicable Closing, a completed and executed copy of the Closing Statement relating to such Closing, attached hereto as Annex A. Except as expressly set forth in the Transaction Documents to the contrary, each party shall pay the fees and expenses of its advisers, counsel, accountants and other experts, if any, and all other expenses incurred by such party incident to the negotiation, preparation, execution, delivery and performance of this Agreement. The Company shall pay all Transfer Agent fees (including, without limitation, any fees required for same-day processing of any instruction letter delivered by the Company and any exercise notice delivered by a Purchaser), escrow related fees or expenses, stamp taxes and other taxes and duties levied in connection with the delivery of any Securities to the Purchasers. Notwithstanding anything to the contrary in this Section 6.2, in the event that this Agreement is terminated pursuant to Section 6.1 hereof or subsequent to a Material Adverse Change, the Company shall pay all out-of-pocket expenses of the Advisors (including but not limited to the reasonable fees and disbursements of EGS and reasonable travel costs) actually incurred in connection with the transactions contemplated hereunder. The Company shall pay all fees and expenses incident to the performance of or compliance with the issuance of the Securities, including without limitation (a) all registration and filing fees and expenses, including without limitation those related to filings with the Commission, any Trading Market, any required filing with FINRA by the placement agent, and in connection with applicable state securities or Blue Sky laws, (b) printing expenses (including without limitation expenses of printing certificates for Registrable Securities), (c) messenger, telephone and delivery expenses, (d) fees and disbursements of counsel for the Company and counsel for Merck Global Health Innovation Fund, LLC, (e) reasonable fees and expenses of all other Persons retained by the Company in connection with the consummation of the transactions contemplated by this Agreement, and (f) all listing fees to be paid by the Company to the Trading Market.

6.3 **Entire Agreement.** The Transaction Documents, together with the exhibits and schedules thereto, contain the entire understanding of the parties with respect to the subject matter hereof and thereof and supersede all prior agreements and understandings, oral or written, with respect to such matters, which the parties acknowledge have been merged into such documents, exhibits and schedules. At or after the applicable Closing, and without further consideration, the Company will execute and deliver to the Purchasers such further documents as may be reasonably requested in order to give practical effect to the intention of the parties under the Transaction Documents.

6.4 **Notices.** Any and all notices or other communications or deliveries required or permitted to be provided hereunder shall be in writing and shall be deemed given and effective on the earliest of: (a) the date of transmission, if such notice or communication is delivered via facsimile or email at the facsimile number or email address as set forth on the signature pages attached hereto at or prior to 6:30 p.m. (New York City time) on a Trading Day, (b) the next Trading Day after the date of transmission, if such notice or communication is delivered via facsimile or email at the facsimile number or email address as set forth on the signature pages attached hereto on a day that is not a Trading Day or later than 6:30 p.m. (New York City time) on any Trading Day, (c) the second (2nd) Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service or (d) upon actual receipt by the party to whom such notice is required to be given. The address for such notices and communications shall be as set forth on the signature pages attached hereto.

6.5 Amendments; Waivers. No provision of this Agreement may be waived, modified, supplemented or amended except in a written instrument signed, in the case of an amendment, by the Company and Purchasers holding at least 67% in interest of the Shares then outstanding and beneficially owned by the Purchasers in the aggregate as of such date, or, in the case of a waiver, by the party against whom enforcement of any such waived provision is sought, provided that if any amendment, modification or waiver disproportionately and adversely impacts a Purchaser (or group of Purchasers), the consent of such disproportionately impacted Purchaser (or group of Purchasers) shall also be required. No waiver of any default with respect to any provision, condition or requirement of this Agreement shall be deemed to be a continuing waiver in the future or a waiver of any subsequent default or a waiver of any other provision, condition or requirement hereof, nor shall any delay or omission of any party to exercise any right hereunder in any manner impair the exercise of any such right. Any proposed amendment or waiver that disproportionately, materially and adversely affects the rights and obligations of any Purchaser relative to the comparable rights and obligations of the other Purchasers shall require the prior written consent of such adversely affected Purchaser. Any amendment effected in accordance with this Section 6.5 shall be binding upon each Purchaser and holder of Securities and the Company. Notwithstanding the foregoing, a waiver or consent to depart from the provisions hereof with respect to a matter that relates exclusively to the rights of Purchasers under Article V may be given by Purchasers holding at least a majority of the Registrable Securities to which such waiver or consent relates.

6.6 Headings. The headings herein are for convenience only, do not constitute a part of this Agreement and shall not be deemed to limit or affect any of the provisions hereof.

6.7 Successors and Assigns. This Agreement shall be binding upon and inure to the benefit of the parties and their successors and permitted assigns. The Company may not assign this Agreement or any rights or obligations hereunder without the prior written consent of each Purchaser (other than by merger). Any Purchaser may assign any or all of its rights under this Agreement to any Person to whom such Purchaser assigns or transfers any Securities, provided (i) such transferor agrees in writing with the transferee or assignee to assign such rights, and a copy of such agreement is furnished to the Company after such assignment, (ii) the Company is furnished with written notice of (x) the name and address of such transferee or assignee and (y) the Registrable Securities with respect to which such registration rights are being transferred or assigned, (iii) following such transfer or assignment, the further disposition of such securities by the transferee or assignee is restricted under the Securities Act and applicable state securities laws, (iv) such transferee agrees in writing to be bound, with respect to the transferred Securities, by the provisions of the Transaction Documents that apply to the "Purchasers" and (v) such transfer shall have been made in accordance with the applicable requirements of this Agreement and with all laws applicable thereto.

6.8 No Third-Party Beneficiaries. The Advisors shall be the third party beneficiaries of the representations and warranties of the Company in Section 3.1 and the representations and warranties of the Purchasers in Section 3.2. This Agreement is intended for the benefit of the parties hereto and their respective successors and permitted assigns and is not for the benefit of, nor may any provision hereof be enforced by, any other Person, except as otherwise set forth in Section 4.8, 4.9 and this Section 6.8.

6.9 Governing Law. All questions concerning the construction, validity, enforcement and interpretation of the Transaction Documents shall be governed by and construed and enforced in accordance with the internal laws of the State of New York, without regard to the principles of conflicts of law thereof. Each party agrees that all legal Proceedings concerning the interpretations, enforcement and defense of the transactions contemplated by this Agreement and any other Transaction Documents (whether brought against a party hereto or its respective affiliates, directors, officers, shareholders, partners, members, employees or agents) shall be commenced exclusively in the state and federal courts sitting in the City of New York. Each party hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in the City of New York, Borough of Manhattan for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein (including with respect to the enforcement of any of the Transaction Documents), and hereby irrevocably waives, and agrees not to assert in any Action or Proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such Action or Proceeding is improper or is an inconvenient venue for such Proceeding. Each party hereby irrevocably waives personal service of process and consents to process being served in any such Action or Proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Agreement and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by law. If any party hereto shall commence an Action or Proceeding to enforce any provisions of the Transaction Documents, then, in addition to the obligations of the Company under Section 4.8, the prevailing party in such Action or Proceeding shall be reimbursed by the non-prevailing party for its reasonable attorneys' fees and other costs and expenses incurred with the investigation, preparation and prosecution of such Action or Proceeding.

6.10 Survival of Representations and Warranties. The representations and warranties contained herein shall survive the applicable Closing and the delivery of the Securities for the applicable statute of limitations.

6.11 Execution. This Agreement may be executed in two or more counterparts, all of which when taken together shall be considered one and the same agreement and shall become effective when counterparts have been signed by each party and delivered to each other party, it being understood that the parties need not sign the same counterpart. In the event that any signature is delivered by facsimile transmission or by e-mail delivery of a ".pdf" format data file, such signature shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such facsimile or ".pdf" signature page were an original thereof.

6.12 Severability. If any term, provision, covenant or restriction of this Agreement is held by a court of competent jurisdiction to be invalid, illegal, void or unenforceable, the remainder of the terms, provisions, covenants and restrictions set forth herein shall remain in full force and effect and shall in no way be affected, impaired or invalidated, and the parties hereto shall use their commercially reasonable efforts to find and employ an alternative means to achieve the same or substantially the same result as that contemplated by such term, provision, covenant or restriction. It is hereby stipulated and declared to be the intention of the parties that they would have executed the remaining terms, provisions, covenants and restrictions without including any of such that may be hereafter declared invalid, illegal, void or unenforceable.

6.13 Rescission and Withdrawal Right. Notwithstanding anything to the contrary contained in (and without limiting any similar provisions of) any of the other Transaction Documents, whenever any Purchaser exercises a right, election, demand or option under a Transaction Document and the Company does not timely perform its related obligations within the periods therein provided, and such Purchaser is prejudiced thereby, then such Purchaser may rescind or withdraw, in its sole discretion from time to time upon written notice to the Company, any relevant notice, demand or election in whole or in part without prejudice to its future actions and rights; provided, however, that in the case of a rescission of an exercise of a Warrant, the applicable Purchaser shall be required to return any partial delivery of shares of Common Stock subject to any such rescinded exercise notice concurrently with the return to such Purchaser of the aggregate exercise price paid to the Company for such shares and the restoration of such Purchaser's right to acquire such shares pursuant to such Purchaser's Warrant (including, issuance of a replacement warrant certificate evidencing such restored right).

6.14 Replacement of Securities. If any certificate or instrument evidencing any Securities is mutilated, lost, stolen or destroyed, the Company shall issue or cause to be issued in exchange and substitution for and upon cancellation thereof (in the case of mutilation), or in lieu of and substitution therefor, a new certificate or instrument, but only upon receipt of evidence reasonably satisfactory to the Company of such loss, theft or destruction and the execution by the holder thereof of a customary lost certificate affidavit of that fact. The applicant for a new certificate or instrument under such circumstances shall also pay any reasonable third-party costs (including customary indemnity) associated with the issuance of such replacement Securities.

6.15 Remedies. In addition to being entitled to exercise all rights provided herein or granted by law, including recovery of damages, each of the Purchasers and the Company will be entitled to specific performance under the Transaction Documents. The parties agree that monetary damages may not be adequate compensation for any loss incurred by reason of any breach of obligations contained in the Transaction Documents and hereby agree to waive and not to assert in any Action for specific performance of any such obligation the defense that a remedy at law would be adequate.

6.16 Adjustments in Share Numbers and Prices. In the event of any stock split, subdivision, dividend or distribution payable in shares of Common Stock (or other securities or rights convertible into, or entitling the holder thereof to receive directly or indirectly shares of Common Stock), combination or other similar recapitalization or event occurring after the date hereof and prior to the applicable Closing, each reference in any Transaction Document to a number of shares or a price per share shall be amended to appropriately account for such event.

6.17 Independent Nature of Purchasers' Obligations and Rights. The obligations of each Purchaser under any Transaction Document are several and not joint with the obligations of any other Purchaser, and no Purchaser shall be responsible in any way for the performance or non-performance of the obligations of any other Purchaser under any Transaction Document. Nothing contained herein or in any other Transaction Document, and no action taken by any Purchaser pursuant hereof or thereto, shall be deemed to constitute the Purchasers as a partnership, an association, a joint venture or any other kind of entity, or create a presumption that the Purchasers are in any way acting in concert or as a group with respect to such obligations or the transactions contemplated by the Transaction Documents. Each Purchaser shall be entitled to independently protect and enforce its rights, including, without limitation, the rights arising out of this Agreement or out of the other Transaction Documents, and it shall not be necessary for any other Purchaser to be joined as an additional party in any proceeding for such purpose. Each Purchaser has been represented by its own separate legal counsel in its review and negotiation of the Transaction Documents. For reasons of administrative convenience only, each Purchaser and its respective counsel have chosen to communicate with the Company through EGS. EGS does not represent any of the Purchasers and only represents the Advisors. The Company has elected to provide all Purchasers with the same terms and Transaction Documents for the convenience of the Company and not because it was required or requested to do so by any of the Purchasers.

6.18 Indemnity of Advisors. Each party hereto agrees for the express benefit of the Advisors, their respective affiliates and representatives that:

(a) Neither the Advisors nor any of their respective affiliates or representatives (i) have any duties or obligations other than those specifically set forth herein or in the engagement letter, dated February 26, 2016 between the Company and the Advisors (the "Engagement Letter") or (ii) shall be liable (x) for any action taken, suffered or omitted by the Advisors in good faith and reasonably believed to be authorized or within the discretion or rights or powers conferred upon it by the Transaction Documents or (y) for anything with the Advisors may do or refrain from doing in connection with any Transaction Document, except for an Advisor's own willful misconduct or bad faith or that of its affiliates or representatives.

(b) The Advisors and any of their respective affiliates or representatives shall be entitled to (i) rely on, and shall be protected in acting upon any certificate, instrument, opinion, notice, letter or any other document or security delivered to any of them by or on behalf of the Company and (ii) be indemnified by the Company for acting as Advisors hereunder pursuant to the indemnification provisions set forth in the Engagement Letter, which are hereby incorporated by reference herein.

6.19 Liquidated Damages. The Company's obligations to pay any partial liquidated damages or other amounts owing under the Transaction Documents is a continuing obligation of the Company and shall not terminate until all unpaid partial liquidated damages and other amounts have been paid notwithstanding the fact that the instrument or security pursuant to which such partial liquidated damages or other amounts are due and payable shall have been canceled.

6.20 Saturdays, Sundays, Holidays, etc. If the last or appointed day for the taking of any action or the expiration of any right required or granted herein shall not be a Business Day, then such action may be taken or such right may be exercised on the next succeeding Business Day.

6.21 Construction. The parties agree that each of them and/or their respective counsel have reviewed and had an opportunity to revise the Transaction Documents and, therefore, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of the Transaction Documents or any amendments thereto. In addition, each and every reference to share prices and shares of Common Stock in any Transaction Document shall be subject to adjustment for reverse and forward stock splits, stock dividends, stock combinations and other similar transactions of the Common Stock that occur after the date of this Agreement.

6.22 **WAIVER OF JURY TRIAL. IN ANY ACTION, SUIT, OR PROCEEDING IN ANY JURISDICTION BROUGHT BY ANY PARTY AGAINST ANY OTHER PARTY, THE PARTIES EACH KNOWINGLY AND INTENTIONALLY, TO THE GREATEST EXTENT PERMITTED BY APPLICABLE LAW, HEREBY ABSOLUTELY, UNCONDITIONALLY, IRREVOCABLY AND EXPRESSLY WAIVES FOREVER TRIAL BY JURY.**

[SIGNATURE PAGES FOLLOW]

IN WITNESS WHEREOF, the parties hereto have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

OPGEN, INC.

Address for Notice:
708 Quince Orchard Road, Suite 160
Gaithersburg, MD 20878

By: /s/ Tim Dec
Name: Tim Dec
Title: Chief Financial Officer

Fax: 301-869-9684

With a copy to (which shall not constitute notice):

Ballard Spahr LLP
1735 Market Street, 51st Floor
Philadelphia, PA 19103
Attn: Mary J. Mullany

[SIGNATURE PAGE FOR PURCHASER FOLLOWS]

IN WITNESS WHEREOF, the undersigned have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

Name of Purchaser: Merck Global Health Innovation Fund, LLC

Signature of Authorized Signatory of Purchaser: /s/ William R. Taranto

Name of Authorized Signatory: William R. Taranto

Title of Authorized Signatory: President

Email Address of Authorized Signatory: _____

Facsimile Number of Authorized Signatory: _____

Address for Notice to Purchaser: _____

Address for Delivery of Securities to Purchaser
(if not same as address for notice):

Subscription Amount: \$4,500,000.88

Units: 3,934,427

Underlying Shares: 3,934,427

Underlying Warrants: 3,934,427

Warrant Shares: 2,950,821

EIN Number: _____

[SIGNATURE PAGES CONTINUE]

IN WITNESS WHEREOF, the undersigned have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

Name of Purchaser: Sabby Healthcare Master Fund, Ltd.

Signature of Authorized Signatory of Purchaser: /s/ Robert Grundstein

Name of Authorized Signatory: Robert Grundstein

Title of Authorized Signatory: COO of Purchaser's Investment Manager

Email Address of Authorized Signatory: _____

Facsimile Number of Authorized Signatory: _____

Address for Notice to Purchaser:

Address for Delivery of Securities to Purchaser (if not same as address for notice):

Subscription Amount: \$3,000,001.35

Units / Shares: 2,622,952 @ \$1.14375 per Unit

Warrant Shares: 1,967,214 5 yr. struck @ \$1.3125

EIN Number:

[SIGNATURE PAGES CONTINUE]

IN WITNESS WHEREOF, the undersigned have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

Name of Purchaser: Sabby Volatility Warrant Master Fund, Ltd.

Signature of Authorized Signatory of Purchaser: /s/ Robert Grundstein

Name of Authorized Signatory: Robert Grundstein

Title of Authorized Signatory: COO of Purchaser's Investment Manager

Email Address of Authorized Signatory: _____

Facsimile Number of Authorized Signatory: _____

Address for Notice to Purchaser:

Address for Delivery of Securities to Purchaser (if not same as address for notice):

Subscription Amount: \$1,500,000.68

Units / Shares: 1,311,476 @ \$1.14375 Per Unit

Warrant Shares: 983,607 5 yr. struck @ \$1.3125

EIN Number:

[SIGNATURE PAGES CONTINUE]

IN WITNESS WHEREOF, the undersigned have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

Name of Purchaser: jVen Capital, LLC

Signature of Authorized Signatory of Purchaser: /s/ Evan Jones

Name of Authorized Signatory: Evan Jones

Title of Authorized Signatory: Managing Member

Email Address of Authorized Signatory: _____

Facsimile Number of Authorized Signatory: _____

Address for Notice to Purchaser:

Address for Delivery of Securities to Purchaser
(if not same as address for notice):

Subscription Amount: \$1,000,000.07

Units: 874,317

Underlying Shares: 874,317

Underlying Warrants: 874,317

Warrant Shares: 655,738

EIN Number: _____

[SIGNATURE PAGES CONTINUE]

IN WITNESS WHEREOF, the undersigned have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

Name of Purchaser: Dr. Tim Harris

Signature of Authorized Signatory of Purchaser: /s/ Tim Harris

Name of Authorized Signatory: Tim Harris

Title of Authorized Signatory: _____

Email Address of Authorized Signatory: _____

Facsimile Number of Authorized Signatory: _____

Address for Notice to Purchaser:

Address for Delivery of Securities to Purchaser
(if not same as address for notice):

Subscription Amount: \$50,000.18

Units: 43,716

Underlying Shares: 43,716

Underlying Warrants: 43,716

Warrant Shares: 32,787

EIN Number: _____

[SIGNATURE PAGES CONTINUE]

IN WITNESS WHEREOF, the undersigned have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

Name of Purchaser: Kevin Krenitsky M.D.

Signature of Authorized Signatory of Purchaser: /s/ Kevin Krenitsky

Name of Authorized Signatory: _____

Title of Authorized Signatory: _____

Email Address of Authorized Signatory: _____

Facsimile Number of Authorized Signatory: _____

Address for Notice to Purchaser:

Address for Delivery of Securities to Purchaser
(if not same as address for notice):

Subscription Amount: \$50,000.18

Units: 43,716

Underlying Shares: 43,716

Underlying Warrants: 43,716

Warrant Shares: 32,787

EIN Number: _____

[SIGNATURE PAGES CONTINUE]

IN WITNESS WHEREOF, the undersigned have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

Name of Purchaser: Timothy C. Dec

Signature of Authorized Signatory of Purchaser: /s/ Timothy C. Dec

Name of Authorized Signatory: _____

Title of Authorized Signatory: _____

Email Address of Authorized Signatory: _____

Facsimile Number of Authorized Signatory: _____

Address for Notice to Purchaser:

Address for Delivery of Securities to Purchaser
(if not same as address for notice):

Subscription Amount: \$50,000.18

Units: 43,716

Underlying Shares: 43,716

Underlying Warrants: 43,716

Warrant Shares: 32,787

EIN Number: _____

[SIGNATURE PAGES CONTINUE]

IN WITNESS WHEREOF, the undersigned have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

Name of Purchaser: Robert McG. Lilley

Signature of Authorized Signatory of Purchaser: /s/ Robert McG. Lilley

Name of Authorized Signatory: _____

Title of Authorized Signatory: _____

Email Address of Authorized Signatory: _____

Facsimile Number of Authorized Signatory: _____

Address for Notice to Purchaser:

Address for Delivery of Securities to Purchaser
(if not same as address for notice):

Subscription Amount: \$140,000.72

Units: 122,405

Underlying Shares: 122,405

Underlying Warrants: 122,405

Warrant Shares: 91,804

EIN Number: _____

[SIGNATURE PAGES CONTINUE]

IN WITNESS WHEREOF, the undersigned have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

Name of Purchaser: Vadim M. Sapiro

Signature of Authorized Signatory of Purchaser: /s/ Vadim M. Sapiro

Name of Authorized Signatory: _____

Title of Authorized Signatory: _____

Email Address of Authorized Signatory: _____

Facsimile Number of Authorized Signatory: _____

Address for Notice to Purchaser:

Address for Delivery of Securities to Purchaser
(if not same as address for notice):

Subscription Amount: \$15,000.28

Units: 13,115

Underlying Shares: 13,115

Underlying Warrants: 13,115

Warrant Shares: 9,837

EIN Number: _____

[SIGNATURE PAGES CONTINUE]

IN WITNESS WHEREOF, the undersigned have caused this Securities Purchase Agreement to be duly executed by their respective authorized signatories as of the date first indicated above.

Name of Purchaser: Albert J. Risdorfer

Signature of Authorized Signatory of Purchaser: /s/ Albert J. Risdorfer

Name of Authorized Signatory: _____

Title of Authorized Signatory: _____

Email Address of Authorized Signatory: _____

Facsimile Number of Authorized Signatory: _____

Address for Notice to Purchaser: _____

Address for Delivery of Securities to Purchaser
(if not same as address for notice):

Subscription Amount: \$50,000.18

Units: 43,716

Underlying Shares: 43,716

Underlying Warrants: 43,716

Warrant Shares: 32,787

EIN Number: _____

[SIGNATURE PAGES CONTINUE]

Exhibits

A	Instruction Sheet for Purchasers
B-1	Stock Certificate Questionnaire
B-2	Registration Statement Questionnaire
B-3	Certificate for Investors
B-4	Securities Delivery Instructions
C-1	Opinion of Company Corporate Counsel, Primary Closing Date
C-2	Opinion of Company Corporate Counsel, Secondary Closing Date
D	Plan of Distribution
E	Company Transfer Agent Instructions
F	Lock-Up Agreement
G	Form of Warrant